CONTENTS

JUNE, 1924

Honey Markets		348-349
Editorials		353-355
Activities of Honeybee Larvae	Bruce Lineburg	356-358
Queen-rearing on Small Scale	Jay Smith	358-360
Some Pacific Coast Beekeepers	Dora Stuart	360-363
Learning and Unlearning	Leslie Burr	363, 388
Control of American Foul Brood	Prof. Dan H. Jones	364-365
Exhibit at Ohio State Fair	E. R. Root	366-367
Various Swarm Control Plans	E. F. Atwater	368-369
Peculiar Case of Poisoning	Timberline Riggs	369-370
Outyard Swarm Prevention	A. V. Small	370-371
Water Method for Introducing	W. L. Bell	371-372
Use and Abuse of Excluders	Major Shallard	372
Siftings	J. E. Crane	373
From North, East, West and South		374-378
Heads of Grains from Different Fields		379-381
Gleaned by Asking	Geo. S. Demuth	382-384
Talks to Beginners	Geo. S. Demuth	385-387
A. I. Root's Story of His Own Life		390-391

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Editorial Staff

Geo. S. Demuth and E. R. Root, Editors
H. H. Root, Assistant Editor
H. G. Rowe, M'n'g Editor

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"THE BUSY BEE MEN"
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PEARL AND WALNUT STREETS

HONEY MARKETS

U. S. GOVERNMENT MARKET REPORTS.
Information from Producing Areas (first half of May).

CALIFORNIA POINTS.—Southern California: Weather cool, cloudy or foggy, with no rain. Bees in some areas have reached normal in brood, but in general they are still weak. Orange flow is about over. Yields vary greatly. The general opinion is for one-fourth crop of orange honey, but some beekeepers expect 60 pounds per colony, while many do not look for any surplus. Condition of buckwheat and sage improving. In favorable sections one-half crop white sage may be secured. A little orange honey has been extracted. Beekeepers are expecting 15c per lb. for orange in 60-lb. cans, 14c per lb. in ton lots. Few sales light amber alfalfa comb No. 1, $6.00; No. 2, $4.80. Beeswax, 22-25c per lb. to producers. Northern California.—Abnormal drouth compels beekeepers to feed, and causes anxiety about growth of thistle, and only a light crop of thistle honey expected. Some irrigation pumps in Siskiyou County plan to shut down soon on account of lack of water. What orange honey was secured by the bees was largely consumed in building up. New honey, which is rather dark and very thick and heavy, is in short supply. Many are not extracting. The market is about ½c per lb. stronger. Few sales white thistle honey, ton lots 10½c. A carlot reported held for 11c per lb. Beeswax is selling for 22c per lb. cash, 24c in trade.

PACIFIC NORTHWEST.—Frost and continued cool weather have destroyed or delayed many flowers. In some districts so much fruit bloom was killed by frost that the usual danger from spray poisoning will be lacking. Many are still feeding. Outlook good in favored sections. Some districts report considerable American foul brood. Several carlots still in beekeepers' hands, for which 10-12c per lb. is being asked, but little demand reported. Few sales white alfalfa, 60-lb. cans, 12½c; ton lots, 11c per lb.; amber extracted, sales ton lots, 10c per lb.

INTERMOUNTAIN SECTION.—Season 3 weeks late, and some bees not removed from winter packing until after the first of May. Utah and Southern Idaho are threatened by a severe water shortage, which would mean a light crop. Considerable spring dwindling in Utah and western Colorado, where cold winds and cloudy weather are keeping bees from working on dandelion and fruit bloom. Montana, Wyoming and western Colorado report abundance of moisture and good prospects, with bees building up well on dandelion and fruit bloom. A few scattered cars are left, but supplies are generally light. One car white sweet clover and alfalfa reported sold for 9c per lb., ton lots generally 9c, few 11-12c; one lot, 7¾c; single 60s, 10-12c; few 13½c; small pails, wholesale, 11½-12½c; few 16c, all per lb. A few carlots white extracted are being held for 9½-10c per lb.

ARIZONA POINTS.—In alfalfa area bees are very light in stores, requiring feeding. In mesquite locations conditions are spotted; some report the plants as yielding heavily; others that unfavorable weather has checked the flow. In general, the outlook is favorable for a fair crop of wild honey.

TEXAS POINTS.—Swarming is about over. Mesquite, huajillo and catsclaw have yielded only lightly on account of showers in April and early May. Weather conditions are now favorable for nectar secretion; bees are showing a surplus from hoarhound; and horsemint flow will soon be on. A hail storm on May 18 did considerable damage to flow in central state. Little extracting so far, but many beekeepers will extract later in the month. Few sales beeswax, light 22-23c in cash, 25c in trade, dark, 18-20c per lb.

PLAINS AREA.—Cold, windy weather hindering bees from working on fruit bloom, willow and dandelions. Snowfall reported in parts of Iowa second week in May. Many bees still need feeding. Clover came through the winter in good shape, and prospects are favorable for a fine clover flow as there is plenty of moisture in the ground to keep the plants coming along. Few sales reported, ton lots white clover extracted, 10¼-11c; single 60s, 13-15c; 5-lb. pails, 15-18c; all per lb. Beeswax has sold in small lots at 24c per lb.

EAST CENTRAL AND NORTH CENTRAL STATES.—Clover is in good condition, but brood-rearing has been retarded by the very cold, windy, rainy spring. Bees have been able to work only a few days on dandelion and fruit bloom. Some colonies are starving due to lack of stores, and many must be fed shortly. With favorable weather, prospects are for a good crop. Demand light, but little honey now on hand. Few sales extracted white clover, 60-lb. cans, 13½c per lb.; ton, 10-12c; small pails; wholesale, 15c per lb.; amber, 60s, 11c per lb.; one lot buckwheat extracted reported sold at 7c per lb. Beeswax, 25c per lb. to producer.

PORTO RICO.—It has been quite dry over most of the island, but some honey is now coming in in the hill sections. A little honey is being offered for sale from coast apiaries.

NORTHEASTERN STATES.—Season continues cold and cloudy, very backward. Bees very short of stores. Considerable feeding has been done, and more will be necessary if bees are not to starve, unless weather warms up. Maple is in bloom, and fruit bloom should open in a few days. Colonies are building up well. 1923 crop is well cleaned up. Few sales white clover extracted, ton lots, 11c per lb., single 60s, 12-12½c; buckwheat ton lots, 8½c; single 60s, 10c. Few cases white comb sold at $5.00-6.00 per case.

SOUTHEASTERN STATES.—The spring flow in Georgia has been about normal, in spite of many days being cold, rainy and windy, and extracting is just beginning. Demand for queens and package bees is heavier than usual, taxing shippers to capacity. In some areas bees are in poor condition. The weather in Louisiana has been unfavorable for extracting, but a good crop of honey is expected. The clover honey will be unusually light-colored this year. Bees have been building up rapidly in Alabama, where considerable nectar has been secured from white clover. A good orange crop has been secured in Florida, of lighter color than usual. New honey will be ready in North Carolina in 2 or 3 weeks, and prospects are for a good crop.

H. C. TAYLOR,
Chief of Bureau of Markets.

Special Foreign Quotation.

LIVERPOOL.—The honey market continues firm with very sparse supplies and new arrivals are eagerly awaited, although the Continent is not a buyer at the present moment. The price in American currency is equal to 10½c per lb. We have to report another advance in beeswax, the value being equivalent in American money to about 31 cents per lb.

Liverpool, Eng., May 5. Taylor & Co.

The A. I. Root Company's Report.

Since our last report we have purchased several small lots of water-white extracted white clover honey at 9½c per pound, one carload extracted amber produced in Michigan at 7½c, and one carload of California amber at 7c. All prices f. o. b. shipping point. No comb honey has been purchased.

From Producers' Association.

Bees throughout the intermountain region have not wintered as well as ordinarily, and in view of the very backward season are not building up as rapidly as they might. However, plant conditions are in most localities quite favorable; there is a good stand of the biennial white sweet clover, and dandelions just now are blooming exceedingly well, so that those colonies that happen to be strong

enough are making considerably more than a living. There is a good supply of irrigation water in most of the territory with the exception of portions of Utah and Idaho, and for this reason we are anticipating a good season. The demand for extracted honey has improved some, and we believe all desirable lots will be cleaned up some time before new crop extracted comes on. As for comb honey, we do not know of any place where this can be had.

The Colorado Honey Producers' Ass'n,
Denver, Colo. F. Rauchfuss, Sec.

Honey Producers' Monthly Report.

Early in May we sent to actual honey producers the following questions:

1. What portion (if any) of the 1923 crop is still in the hands of beekeepers in your locality? Give answer in per cent.
2. At what price has honey been sold (if any) in large lots (carload or less) in your locality during the past month? (a) Extracted honey, per pound?
3. What are prices when sold to grocers in case lots? (a) Extracted honey in 5-lb. pails, or other retail packages in terms of 5-lb. pails? (b) Comb honey, fancy and No. 1 per case?
4. What is the retail price to consumers in your locality? (a) Extracted honey in 5-lb. pails, or other retail packages in terms of 5-lb. pails? (b) Comb honey per section?
5. How does the number of colonies in your locality that are in condition to store surplus honey this season compare with the number of such colonies last year? Give answer in per cent.
6. What is the condition of the colonies at present compared with normal, taking into consideration their strength, amount of stores and amount of brood? Give answer in per cent.
7. What is the condition of the honey plants at this time compared with normal? Give answer in per cent.
8. How does the early honey flow (if any) thus far compare with normal? Give answer in per cent.

The answers, as returned by our honey and bee reporters, are as follows:

State.	Reported by—	Crop Unsold.	Ex. in Carlots.	In small lots. Ex.	In small lots. Comb.	Retail prices. Ex.	Retail prices. Comb.	No. Cols.	Col. Con.	Plant Con.	Hon. Fl.
Ala.	J. M. Cutts	..	..	..	..	..	..	75..	85..	90..	90
Ark.	J. Johnson	..	..	..	..	..	..	80..	60..	100..	80
Ark.	J. V. Ormond	..	..	..	..	..	..	97..	75..	100..	
Cal.	L. L. Andrews	..	..	..	..	$1.00..	$.25..	20..	40..	50..	50
Cal.	M. C. Richter	5..	..	..	..	..	.30..	40..	80..	60..	30
Cal.	G. Larinan	5..	..	..	..	1.00..	..	90..	80..	25..	50
Cal.	M. H. Mendleson	..	..	..	..	1.10..	.35..	50..	100..	0..	
Cal.	M. A. Sayler	0..	$.09..	$0.75..	$4.80..	1.00..	.25..	90..	90..	75..	75
Col.	B. W. Hopper	0..	..	..	..	..	..	100..	100..	100..	100
Conn.	A. Latham	4..	..	1.00..	6.50..	1.25..	.35..	100..	75..	110..	
Fla.	C. C. Cook	0..	.07..	.75..	..	.95..	..	110..	110..	125..	110
Fla.	H. Hewitt	0..	..	.75..	..	1.00..	..	110..	100..	100..	35
Fla.	F. E. Munson	0..	..	.65..	..	.85..	..	100..	100..	100..	150
Ga.	J. J. Wilder	0..	..	..	..	..	..	100..	100..	100..	100
Ida.	J. E. Miller	0..	.09¼	..	..	..	..	105..	105..	100..	100
Ill.	C. F. Bender	0..	..	..	..	..	.30..	90..	100..	80..	60
Ill.	A. L. Kildow	0..	..	..	..	.75..	.25..	100..	110..	60..	
Ind.	E. S. Miller	10..	..	.80.	5.75..	1.00..	.30..	85..	100..	100..	
Ind.	J. Smith	0..	..	1.05..	..	1.25..	.35..	75..	75..	150..	
Iowa.	E. G. Brown	3..	.10..	.75..	..	1.25..	..	85..	100..	100..	
Iowa.	F. Coverdale	0..	..	..	..	..	.30..	75..	90..	100..	100
Iowa.	W. S. Pangburn	25..	..	.75..	..	.80..	..	..	90..	100..	
Kan.	J. A. Nininger	5..	..	.75..	5.00..	.95..	.25..	100..	100..	100..	
Kan.	F. Hill	0..	..	..	5.50..	1.00..	.30..	110..	110..	100..	
Ky.	P. C. Ward	0..	..	..	..	..	..	100..	90..	100..	
Me.	O. B. Griffin	5..	..	1.25..	6.50..	1.50..	.38..	100..	100..	90..	
Mass.	B. N. Gates	..	..	..	..	..	..	80..	80..	70..	
Mich.	I. D. Bartlett	5..	..	.75..	5.00..	1.00..	.32..	100..	90..	100..	
Mich.	F. Markham	5..	.10¼	.80..	..	1.20..	..	90..	100..	125..	
Mich.	E. D. Townsend	20..	..	..	..	..	..	100..	90..	100..	
Md.	S. G. Crocker, Jr.	5..	..	1.00..	5.75..	1.50..	.32..	100..	100..	110..	100
Mo.	J. H. Fisbeck	0..	..	..	..	..	..	100..	100..	80..	
Mo.	J. M. Romberger	0..	..	..	..	1.00..	.27..	50..	50..	60..	
Neb.	J. H. Wagner	..	..	..	..	..	..	..	90..	90..	90
Nev.	T. V. Damon	0..	..	..	..	..	..	80..	80..	80..	80
N. Y.	G. B. Howe	5..	.12½	.75..	..	1.00..	.27..	..	60..	90..	
N. Y.	R. B. Willson	1..	..	.75..	5.00..	1.12..	.30..	125..	80..	100..	60
N. Y.	F. W. Lesser	0..	.12..	..	..	1.00..	.30..	90..	75..	100..	50
N. C.	W. J. Martin	0..	.10..	1.00..	5.00..	1.25..	.30..	90..	100..	100..	100
N. C.	C. L. Sams	0..	..	1.00..	5.00..	1.25..	.30..	100..	100..	90..	100
Ohio.	R. D. Hiatt	10..	..	1.00..	..	1.40..	..	95..	95..	100..	90
Ohio.	F. Leininger	..	..	..	..	..	..	..	..	75..	100
Ohio.	J. F. Moore	5..	..	.85..	4.30..	1.10..	.25..	90..	90..	95..	90
Okla.	J. Heueisen	0..	..	..	..	1.25..	.40..	70..	80..	100..	60
Okla.	C. F. Stiles	0..	..	.85..	5.50..	1.15..	.32..	90..	90..	90..	100
Ore.	H. A. Scullen	10..	..	.80..	..	1.00..	.30..	100..	90..	110..	80
Pa.	D. C. Gilham	15..	..	1 05..	7.20..	1.40..	.40..	100..	105..	100..	
Pa.	C. N. Greene	..	..	..	..	.90..	.25..	100..	90..	100..	100
Pa.	H. Beaver	0..	..	..	..	..	..	100..	90..	90..	
Tenn.	J. M. Buchanan	0..	..	..	..	1.25..	.35..	80..	90..	110..	110
Tex.	T. A. Bowden	0..	..	.80..	..	1.10..	..	100..	100..	90..	110
Tex.	J. N. Mayes	0..	.12½	.70..	..	.75..	..	90..	100..	90..	100
Utah.	M. A. Gill	..	..	.60..	4.00..	.70..	.20..	110..	90..	75..	75
Vt.	J. E. Crane	1..	..	1.00..	4.87..	1.20..	.20..	110..	100..	110..	100
Va.	L. N. Gravely	0..	..	..	..	1.25..	.35..	90..	92..	80..	80
Wash.	W. L. Cox	20..	..	..	..	..	..	105..	100..	90..	85
Wash.	G. W. B. Saxton	50..	.10..	.65..	..	.75..	..	100..	115..	100..	100
W. Va.	T. K. Massie	..	..	..	..	1.00..	.32..	70..	60..	90..	
Wis.	N. E. France	5..	..	.75..	4.20..	1.00..	.30..	75..	80..	100..	
Wis.	C. Hassinger, Jr.	3..	..	.80..	..	1.00..	..	85..	90..	90..	
Wis.	H. F. Wilson	1..	.11..	..	6.00..	1.05..	.35..	90..	75..	100..	75
Wyo.	A. D. Brown	25..	..	..	..	..	..	100..	100..	100..	

Buckeye Bee Hives

There is no real success in beekeeping without a good hive. The Buckeye double-walled hive fills this requirement. Prices are lower than last year. Let us quote you on them.

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Are you going to produce more comb honey this season? If so, you should order your equipment this month. We have it. Plenty of supers mean a larger crop of honey.

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The Root Honey Extractors are known for their durability, and the very satisfactory service they give. Six sizes of hand machines, and eight power machines to select from. We have the one that will suit your needs.

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QUEEN PRICES

Quantity:	1-9 ea.	10-24 ea.	25-49 ea.	50-99 ea.	100 up, ea.
Untested	$1.50	$1.35	$1.25	$1.10	$1.00
Select Untested...	2.00	1.80	1.70	1.55	1.45
Tested	2.50	2.25	2.10	2.00	1.85
Select Tested.....	3.00	2.70	2.55	2.40	2.25

OUR GUARANTEE ON QUEENS

We guarantee safe arrival of queens sent in mailing cages. We agree to refund the money or replace the queen if the one first sent arrives dead, provided the beekeeper receiving the dead or unfit queen notifies us and returns her at once and in her own shipping cage, properly marked with name and address of sender. No delay in returning the queen can be permitted. This guarantee applies only on queens sent to customers in the United States and Canada.

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The best beekeeping authorities agree with us in the opinion that the shipping of bees on combs containing honey and brood invites the spread of disease. We are now shipping bees only in combless packages, except in carload qunatities under special conditions.

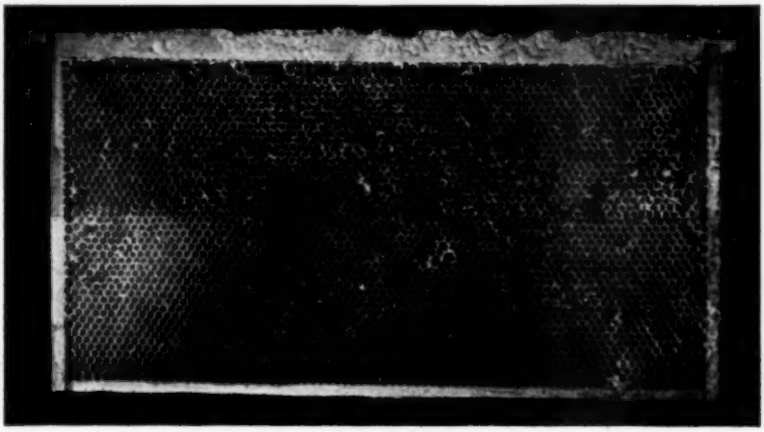
	1-9 pkgs.	10-24 pkgs.	25 up, pkgs.
2-lb. pkg of bees by express...	$6.00 ea.	$5.50 ea.	$5.00 ea.

Add price of queens wanted to package price given above. Large quantity lots quoted on application. These prices are F. O. B. shipping point.

BEES AND QUEENS ARE NOT SHIPPED C. O. D.

THE A. I. ROOT COMPANY

WEST SIDE STATION, MEDINA, OHIO.



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Without Damage!

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The above comb was taken right from a power extractor, after being extracted at full speed. The picture was taken on two big films which were then center spliced, where the line appears. This gives clear detail, showing how firmly the comb stood up; no buckles, no breaks, and no surface damage.

This was a new comb; not an old, tough one. Did you ever try to extract new combs, built the old way, from hand-wired foundation? High speed usually broke them in places; it often ruined them. Combs from Wired Foundation stand the test as though they had been in the brood nest three or four years.

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GLEANINGS IN BEE CULTURE

JUNE, 1924

EDITORIAL

OUR CORNERSTONE

REMEMBER at all times that improved bee culture is our end and aim and we trust no one will hesitate to give any facts from experience, because they may tend to overthrow any particular person or "hobby." If any of our special plans don't work, or if anything we advertise has had its value overestimated, here in these pages is the place of all others to set the error right.—From A. I. Root's "introductory" in the first issue of Gleanings in Bee Culture, January 1, 1873.

Important Work on Disinfectants.

THE article beginning on page 364 by Professor Dan H. Jones was received after the first side of this journal had gone to press, but the results of his experiments are of so much importance at this time that room had been made for it by omitting the pages "Just News" and "Bees, Men and Things." This explains why this important article could not be given a more prominent position. It is somewhat surprising to find that of the various disinfectants tried only Hutzelman's solution (alcohol-formalin) and a mixture of formalin and water were effective in destroying the spores of American foul brood in the scales in combs, especially after Professor Wilson of the University of Wisconsin reported success with sodium hypochlorite in this journal last year.

It is not surprising, however, that formalin mixed with water instead of with alcohol destroyed the spores under laboratory methods. When Dr. Hutzelman first announced his discovery he pointed out that the alcohol is merely the vehicle which carries the real disinfectant (formalin) into the innermost recesses of the comb. If water had the penetrating quality and the ability slowly to dissolve wax possessed by alcohol, it could be used instead; but, in case of sealed cells and occasional stray cells of pollen and honey, alcohol is no doubt the proper vehicle, at least for the present. Since the discovery by Dr. Hutzelman that diseased combs can be sterilized, so many are working on this problem that the atmosphere is clearing rapidly and new developments may be expected at any time.

Eradicating American Foul Brood.

IN his article beginning on page 363 of this issue, Leslie Burr sets forth some of the reasons why American foul brood is still so destructive in this country in spite of the efficient work of inspectors in many states. Carelessness and ignorance of the nature of the disease are the great barriers in the way of reducing loss from this malady. The Editor can not agree, however, with the advice given in the last paragraph of Mr. Burr's article, that all the colonies in the apiary be treated when some are found diseased. This advice has been given before by other good beekeepers, and it may be the best thing to do in case of an unusually high percentage of infection especially in the tropics; but in the North in the hands of a careful beekeeper the percentage of diseased colonies usually found is so low that it would be extremely wasteful to treat all the colonies to cure a few.

On to Quebec in September.

GLEANINGS suggests that some arrangement be made in advance so that those who attend the Seventh International Congress of Beekeepers (Sept. 1-4) can travel together at least a part of the way. Perhaps enough will go from the west and middle west to fill a car from Chicago or some other central point, and from the southeast and east to fill a car from New York. Plans are being made for those coming from Europe to travel together. Such an arrangement could be made through the American Honey Producers' League or through this office if those who expect to go will write in. No doubt the other bee journals will be glad to help bring about such an arrangement. The editors of both the American Bee Journal and Gleanings are planning to attend this great meeting.

AS mentioned in our "Just News" page in both the March and May issues, honey is now being used in the Betsy Ross bread. This new move on the part of the Betsy Ross bread people is of special interest to beekeepers, for the Betsy Ross formula is used by bakers throughout the country. When honey was added to the formula the various bakers put on an intensive campaign of advertising, using in some cases a full-page display advertisement in the local newspaper illustrating a loaf of bread, a pitcher of milk and a plate of comb honey. The advertising value of such a combination of wholesome foods must be tremendous, and the possibilities of this move as affecting the beekeeping industry in this country may be of extreme importance. If the American people can be induced to demand that the bread they eat be made with honey, a new outlet for honey would thus be created that would be felt by every honey producer in the country.

Use of Honey in Making Bread.

If the 800,000 or more beekeepers in the United States will now insist upon purchasing only bread made with honey and will induce their neighbors and friends to do likewise, it would not be long until other bakers would add honey to their formula for bread-making. The Editor is now eating bread made with honey and expects to continue doing so as long as a loaf so made is on the market. Here is an opportunity to get behind a movement that may go a long ways toward solving some of our marketing problems.

WHILE it may seem rather early to be thinking about winter stores and about food for spring brood-rearing in 1925, it is none too early for those who expect to use food chambers to complete arrangements for having these filled with the best of honey during the early honey flow. As pointed out by Joseph M. Barr on page 379, the food chamber should be entirely filled and sealed. This can best be accomplished by having the food chamber filled early in the season and left on the hive tiered up among the supers if extracted honey is being produced, or by having colonies set aside to fill these if comb honey is being produced. As has been frequently mentioned in this journal during the past few years, the food-chamber plan for supplying an abundance of winter and spring stores is especially adapted to localities where the winter is not too severe. The Editor has been careful not to recommend this plan for outdoor wintering in Canada and the colder portions of the northern tier of states, although there are several successful users of this plan in these localities. It should be noted that these men believe in uniformly strong colonies and abundant winter protection.

Planning Now for Next Season.

MANY letters and articles submitted for publication in Gleanings have been received, protesting against the article by George H. Dacey, "A Time Clock on the Honeybee," published in the May issue of Popular Science Monthly. Mr. Dacey did get his fact badly mixed up in this article, and it is no wonder that beekeepers are somewhat stirred up on reading it and insist that the errors in the article be corrected. Some of the protests are almost as bitter as those concerning the erroneous statements of Dr. Wm. Brady in a syndicated article recently broadcasted throughout the country, in which he slandered the fair name of honey.

Bee Stories in Popular Magazines.

However, the article in the Popular Science Monthly is not the kind that will harm the beekeeping industry. Instead of hindering the industry, it should be beneficial since it brings bees and honey to the attention of the reading public in a striking if not entirely truthful manner, which should be worth considerable to the beekeeping industry. One great trouble with honey as a commodity is that it lacks publicity. We should not expect popular writers who are not beekeepers to get all of the facts straight in regard to the interesting life of the bee colony, and it would be folly to attempt to teach the American people the thousand and one things well known to beekeepers concerning the life in the bee colony and bee behavior. What we need to teach the American public is that honey is a good and wholesome food, and the oftener the reading public can be induced to read something about honey and how it is produced, the more honey will be consumed. The time to get excited and demand a correction is when some one slanders honey as was done by Dr. Brady—not when a popular writer puts out an interesting and striking article about bees and honey that may have some glaring errors in bee behavior. Erroneous ideas in regard to bee behavior will not reduce the consumption of honey, much as they may irritate truth-loving beekeepers.

Use of Queen-Excluders.

WHEN the honey-extractor first came into use, extracting honey from combs containing brood was not at all uncommon. In fact, in many cases all the combs of the brood-chamber that contained honey were extracted at the same time the combs from the super were extracted. These were taken out of the hive, the honey thrown out and the combs returned at once so that there was little if any danger of the brood being chilled during the process. But modern methods of producing extracted honey demand a complete separation of the brood and the extracting combs. The use of the bee-escape in taking off the honey, together with the inconvenience of returning the combs to the bees within a few hours after taking them off, make it necessary that the extracting combs be free from brood.

There are two ways by which the queen can be excluded from the extracting combs: (1) by means of the queen-excluder, and (2) by crowding the queen down by a rim of honey between the brood-nest and the super. In the case of weak or medium colonies, a very slow honey flow or a fall honey flow, the latter method can be used with but little if any trouble from queens entering and laying in the supers; but, in case of strong colonies and an early honey flow, this plan can not be depended upon.

It is sometimes possible to crowd the queens back into the lower story by placing the empty supers on top of the partly filled one, thus having a super of honey between the brood-chamber and the empty combs above, even during an early honey flow; but in many cases the queen will even pass through a super of honey to the third or fourth story if this is attempted during the height of spring brood-rearing. In some cases the queen can be kept below by means of a shallow extracting super of honey between the brood-chamber and the super above. By using the Jumbo brood-chamber the queen can sometimes be kept below by the rim of honey in the upper portion of the deeper combs; but since the advent of non-sagging foundation by which worker cells extend to the top-bar, there may not be a sufficient rim of honey above the brood in these deeper combs to keep the queen out of the super unless the character of the honey flow, the strength of the colony and the strain of bees are favorable to such a rim of honey in the upper portion of the brood-chamber.

Many have advocated dispensing with queen-excluders on the supposition that they are a barrier to the movement of honey into the supers and impede ventilation. This immediately suggests the question as to which is the greater barrier between the brood and the super—the queen-excluder or the rim of honey. Certainly it would be best to have the least possible barrier between the brood-chamber and the supers, and yet keep the queen below. In the ordinary excluders having wire strips, the openings between the wires are equivalent to an opening nearly six inches wide by the full length of the hive inside, which is about eight times the size of the opening of the entrance when the full ⅞-inch entrance is wide open. The spaces between the top-bars when 10 combs are used total only a little over half as much as the openings through the excluder. When the queen is kept below by a barrier of honey, the spaces between the adjacent combs of honey are only about one-fourth inch in width. In the 11 spaces this would amount to the equivalent of a space 2¾ inches wide by the length of the hive inside, which is considerably less than half that of the openings through the excluder. So far as the openings in the passageways are concerned, the rim of honey is a much greater barrier than the excluder over combs filled with brood to the top-bar. There remains the one difference of the bees being compelled to creep through the small openings in the excluder, but experimental evidence thus far indicates that this does not constitute a barrier to the bees.

In localities where the excluder can be dispensed with, such as those having very slow honey flows as in portions of the alfalfa region and those localities in which the main honey flow comes late in the season, the excluders should, of course, not be used, for they put the combs in the super a half inch further away from the brood and are an added expense to the equipment if nothing more. In other localities where the queen can not be kept below except by interposing several inches of honey between the brood and the supers, excluders are necessary for best results in honey production since by means of the excluder the empty supers can be placed down close to the brood, thus inducing the excess of young bees in the brood-chamber to go into the supers. This brings about a better distribution of bees within the hive, reduces the tendency to swarm, and is conducive to a greater spirit for work than when the queen is crowded down by means of a barrier of honey between the brood and the newly given super above.

XUM

ACTIVITIES OF HONEYBEE LARVAE

By Bruce Lineburg

The Feeding Habits and Movements of the Baby Honeybees

The hatching honeybee larva, upon bursting the chorion or egg case, finds itself surrounded by a mass of food, namely, the royal jelly. This mass of food during the first day of larval life has been shown to be about equal to four times the weight of the larva itself.

The egg case is attached to the base of the cell by the queen when the egg is laid. From this case the larva withdraws itself promptly after the case has burst. The larva at once assumes a bent or semicircular form and continues the same forward movement which it employed in withdrawing itself from the egg case. If a comb containing such larvae is removed from the hive, the movements of these larvae may be observed under the microscope. Such observations show that the larvae are lying on their sides and moving in a circle, the diameter of which is about equal to the length of the larva itself.

If such larvae are transferred to a queen-cell which contains an abundance of fresh royal jelly and the queen-cell then placed in an incubator under proper conditions of temperature and moisture, it will be seen that the larvae do not wander about, eating here and there at the mass of food, but that each follows the usual procedure of moving in a small circle and eating as it moves. At the end of several hours each larva will be found still curved on the bottom of a small hole which it has eaten into the relatively huge mass of food on which it was placed. Because of this fact four or five of these day-old larvae may be fed in a single queen-cell. Each larva will be found exactly where it was placed when it is studied several hours later.

The movement of the larva around and around in the mass of food, with which it is supplied, is apparently of great importance under normal conditions of feeding. In order to understand this point, however, it is necessary to know how food is supplied to the developing larva by the nurse-bees.

How Larval Food is Supplied.

Royal jelly is supplied directly by the mouth and not through the proboscis. During the first days of larval life this food is placed in the cell beside the larva. The food is not placed within the circle which the larva makes as it moves around and around within the cell, but it is placed at the border of the mass of food already present. The young larva, accordingly, is surrounded by a mass of food, as previously stated. At first, this food covers only a portion of the bottom of the cell. Later this mass is increased in size until the whole bottom of the cell is covered with food. After several days food may be placed within the ring formed by the body of the well-developed larva as well as on the sides of the cell outside this ring.

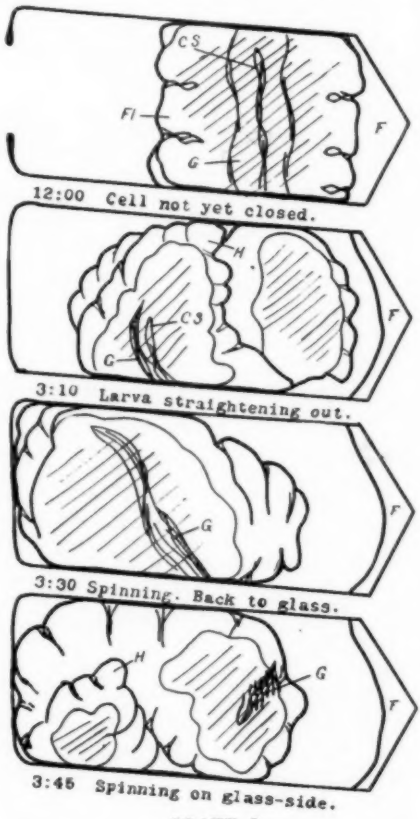


PLATE I.

Sketches made on July 19 to show movements of honeybee larvae. Sketch at 12:00 N. shows full-grown larva with its back pressed tightly against the cell walls. CS, circulatory system; F, food in bottom of cell; Fl, fold on side of body; G, intestine; H, head.

Returning now to a consideration of the feeding conditions on the first day of larval life, it must be remembered that, although the food present in the cell is about four times the size of the larva, the mass of food is in reality but little larger than the head of a pin. If

cells containing larvae of this age are covered with wire cloth so as to exclude the nurse-bees, it will be found that evaporation within the hive is so great that within a few minutes a thin crust is formed over the surface of these minute quantities of food. Within an hour or two the whole mass is reduced to a tough jelly-like substance in which the larva is utterly helpless either to move or to feed. Such observation must be made under the microscope.

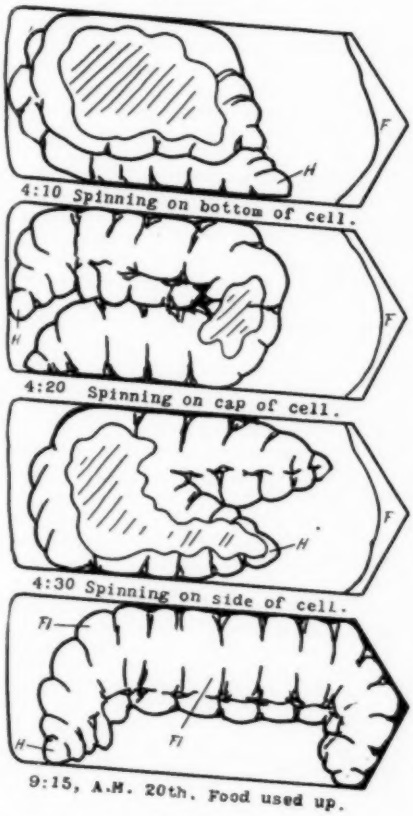


PLATE II.

Sketches made July 19 and 20 to show positions of larvae in spinning on bottom, sides and ends of cell. H, head; F, food; Fl, folds on back and sides. It required 11 minutes on the average for the larva to move from one end of the cell to the other end.

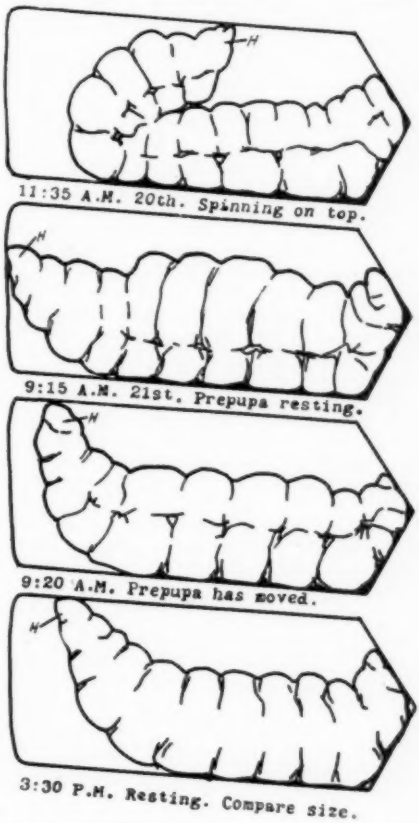


PLATE III.

Sketches made July 20 and 21 to show movements of the larva and of the prepupa or pronymph. The sketch at 9:15 shows the prepupa turned slightly on its side. The other sketches show the normal position, that is, flat on its back.

How Larval Food is Kept Moist.

Under normal conditions the nurse-bees prevent the drying out of the food. This they do by supplying fresh food frequently. In fact, nurse-bees have been seen to visit day-old larvae on an average of once every two minutes. Not all of these visits are made for the purpose of feeding. When food is given, it is placed on the border of the mass already present. The nurse-bees apparently seek to avoid actual contact with the larva.

With these facts in mind it is possible to understand the importance of the circular movement of the larva. By this movement the larva not only brings itself frequently into contact with the fresh supply of food wherever it is added, but the movement itself serves constantly to mix the old supply with the new, and thus keep the entire mass at all times moist and in a condition suitable for ingestion. The movement continues throughout larval life except for periods of rest. It is this same movement which enables the larva to straighten out in the cell and also to move about while spinning its cocoon.

The Method of Movement.

As is well known to students of entomology, the honeybee larva has no legs.

It is therefore unable to crawl as most insect larvae do. In fact, if a young larva is placed on a glass slide with a mass of food just in front of its head or even touching its head, it is unable to move forward the distance of its own length. It perishes accordingly because it is unable to regain a position where it is surrounded by a mass of suitable food. A full-grown larva, likewise, is utterly helpless when placed upon a flat dry surface, but under its natural conditions it probably moves 150 times from end to end of its cell while spinning its cocoon.

The method of movement is probably the same in both the young and fully developed larva. In the fully developed larva this activity appears to be due largely or wholly to a peculiar use of the heavy folds which are conspicuous on its sides and back. These folds are retracted and later protruded again in a more advanced position. The movement somewhat resembles the crawling of a caterpillar, if one can imagine each of the caterpillar's legs to disappear into the body when not actually aiding in the support of the body, the legs appearing again in a more advanced position instead of the usual caterpillar method of raising the leg and moving it forward. Doubtless, these movements of the larva are an aid in its breathing and to the circulation of its blood much as muscular activities are in the case of our own bodies.

When the hatching larva frees itself from the egg case, it forms a small semicircle with its back on the outer circumference. As it grows, it occupies more and more space until its back is pressed tightly against the walls of the cell. Continued growth produces still greater distortion until finally all semblance to the larval shape is lost, and the larva appears as a six-sided plug which fills considerably more than half of the cell.

Because of the extremely compressed condition of the full-grown larva, not only its back but a considerable portion of its sides are actually in contact with the walls of the cell. It appears, therefore, that any creeping movement which is produced must be accomplished by these parts of the body. Such is actually the case. The folds of the back and sides act as locomotor appendages in the manner previously described.

To straighten itself out, the fully developed larva curled in the bottom of the cell, simply turns its head slightly toward the cap of the cell, and the same movement which carried it around in the bottom of the cell now serves to lengthen it out into a short spiral coil (see illustrations). This same movement likewise enables it to reverse its direction readily within the cell while spinning its cocoon.

When the work of spinning its cocoon is finally finished, the larva turns its head toward the cap of the cell and stretches out for a long rest. Stretched out thus, it passes through the various stages of pronymph, pupa, and finally reaches the adult stage. Not until this stage is reached does the creature turn over on its ventral side, thus removing its back from the walls of the cell.

Baltimore, Md.

QUEEN-REARING ON SMALL SCALE

By Jay Smith

How Those Having Only a Few Colonies Can Rear Good Queens. Conditions for Rearing Best Queens

Judging from the general interest taken in the subject, more beekeepers will attempt to rear their own queens this year than ever before. While it is generally recognized that the grafting method is much to be preferred when one wishes to rear, say, 300 or more queens in a season, there are many who have but a dozen colonies, more or less, and they would like to rear a few queens and yet do not care to go to the trouble and expense of learning the grafting method. Then, again, there are old people or others whose eyes are not good enough to see to graft the minute larvae, which is necessary if good queens are to be reared. It is for the benefit of these that this article is written.

Best Time for Beginners to Rear Queens.

No method that does not produce the very best queens should be used. If the method here described is used, and great pains and care taken that all conditions are right, fully as good queens can be reared as are ever reared by a strong colony during the swarming fever. I know it can be done, for I have reared many in this manner. While there are a number of features that make for good or poor queens, the one big outstanding feature is to see that the larva has plenty of royal jelly. Some other minor features are proper incubation and proper nursing and feeding of the newly emerged virgin. In fact, if we expect to duplicate the queens reared during the swarming season, we must duplicate the conditions under which they are reared. The dominant feature in this is to see that the queens are reared during the

swarming season or see to it that there is a constant stimulating feeding with thin syrup during all the time that the cells are being built and up to the time that the young queen begins to lay. To the beginner it is recommended that he first try queen-rearing just as the bees are preparing to swarm, and just as a honey flow is beginning.

Selection of the Breeding Queen.

In the first place you will have to pick out for a breeder the queen that you think is the best. The Italian bee is all but universally recognized as superior to any other for our country. So let us say you should select a pure Italian as your breeder. I have little sympathy for the fellow who breeds from a hybrid because that particular one produced a good crop of honey. There are many beekeepers who claim that hybrids are better than pure stock; but you will hear the same thing among cattle men and hog men. If it is true that a grade cow is as good as a pure-blooded animal, why is it that all the scientific men in our agricultural colleges as well as the Government men are carrying on a campaign for pure-bred stock? It has been proved time and again that the pure-bred animal is best. So it is with bees. Sometimes a hybrid does excel, but in a vast majority of the cases it falls far below the pure-bred Italian.

Having selected your breeder, and as the honey flow is coming on and the hives are getting crowded with young bees, pollen and nectar, it is time to begin queen-rearing. A frame of honey or an empty comb is removed from the colony containing your breeding queen. The brood is spread and in the center is placed an empty comb. The queen will usually begin laying in this comb in an hour or two after it is put into the hive. Examine it the next day to see if there are eggs deposited in it. If there are, all is well; if not, replace it till there are eggs in it. Do not leave it till the eggs begin to hatch, for we wish to give the bees plenty of time to deposit royal jelly in the cells later on.

The Cell-building Colony.

Next go to a strong colony that is running over with bees. If this colony is building cells preparatory to swarming, so much the better. Take away the queen and all the brood, sealed as well as unsealed. If you wish to keep the queen, you can cage her in another colony; but, as you are going to rear some queens, you will probably prefer to destroy her unless she is a good one. For this reason it is well to choose for the cell-building colony one that has a queen that you are going to replace. Leave in the cell-building colony four or five combs of pollen and honey.

Now go to the colony containing the breeding queen and take out the comb of eggs. It is best that there be not many eggs in this comb, for it is our intention to get the bees in the cell-building colony to focus their attention on a few instead of dividing their jelly supply among a large horde of worker larvae. If there are too many eggs in the cells, say, more than two or three hundred, it is an easy matter to remove them. You can take a dipper of water and, holding it three or four feet above the comb, pour it into the cells and wash out the eggs on one side of the comb. However, this is not usually necessary unless the comb is nearly filled with eggs. Now set this comb into the cell-building colony and the bees will do the rest.

Having been feeding a large number of larvae, they are in condition to feed the larvae in the comb as soon as they hatch. They also realize that they are queenless, and so go to work on the cells even before the eggs are hatched. Many of these worker-cells will be enlarged, and in some cases royal jelly will be deposited at one side of the egg as if the bees were tired of waiting for the egg to hatch and had left the food there for the baby so as to be sure to be on time. In this manner the larvae will get the maximum amount of jelly placed in their cells. In about four days it is well to look at the comb.

In many cases two or more cells will be built together. It would be difficult to separate them without injury, so it is well to leave the best one in the cluster, and with a toothpick or match remove the remaining larvae in the cluster. Likewise if there are over 15 or 20, the smaller should be destroyed. The bees at once clean out the jelly in these cells and, while I cannot prove it, I believe they place it, or at least a part of it, in the cells containing the queen larvae. I have some times fed an ounce or more of royal jelly to cell-building colonies, and I believe the cells were better filled with jelly for so doing. However, I may have been mistaken. Cells built after this fashion will produce as good queens as the best.

Caring for the Ripe Queen-cells.

In about 12 days after giving the comb, the cells are ready to remove. If left longer, there is danger that a virgin might emerge and tear down all the remaining cells. You can then go to a colony that you wish to requeen, remove the queen and give the colony one of the cells. A circle should be cut around the cell, cutting through the

comb. A corresponding circle should be cut in the comb of the colony to be requeened and the comb with the cell inserted. If a good honey flow is on, the bees will not tear down the cell. If there is no honey flow, it is well to give the colony a good feed of syrup and the bees will not tear down the cell.

In case it is desired to introduce laying queens to the colonies instead of giving the cell, nuclei can be formed. Two frames of brood with bees may be taken from a hive and the cell given as described. These can be placed in an empty hive or nucleus box. They should be put in a cool place out of the sun, the bees shut in for two days and the entrance opened after dark. In time the virgin will emerge, in seven or eight days she will take her mating flight and in a couple of days more will begin to lay.

If it is not desired to use this nucleus for mating more queens, introducing the queen will be much simplified. The two frames in the nucleus are set in an empty hive body, and this set on top of the colony that is to be requeened after first removing the old queen and placing a newspaper between the two hives. In three days the combs and queen are set down in the lower hive, and the colony is requeened.

Vincennes, Ind.

SOME PACIFIC COAST BEEKEEPERS

By Dora Stuart

Rich Sources of Gold in California Entirely Overlooked by the Gold Seekers of '49

Casual acquaintances of Robert Williams naturally supposed, when they gave the subject a thought, that he located in Oroville simply because he was offered a job there. Intimate friends knew better. He really had the choice of two jobs in California, and had he chosen the other he would now be a resident of Santa Clara Valley.

But like the immigrants of '49, he followed the lure of gold. It was not the simultaneous rush of mad adventurers from all parts of the compass that drew him into its swift current, nor even the blazed trail of the later stream of immigrants who discovered an unlimited vein of gold in the form of agriculture on such land as was still available after the fortune hunters had turned the earth "upside down" in their dredging operations.

Mr. Williams cared little for agriculture as a pursuit. But the gold of the orange was a lure not to be withstood. Orange groves meant orange blossoms; orange blossoms meant food for bees; and bee pasture held the possibility of embarking, for the fourth time, into what was to him the most fascinating of all adventures, bee culture.

About the time Mr. Williams uttered his first faint protest in this world, the first commercial orange grove was being planted in Thermalito by the Oroville Citrus Association, although 20 years prior to that time an orange tree known as "The Mother Tree," because it gave to Butte County its citrus industry, had been planted at Bidwell Bar.

The New Scramble for Gold.

That was a period of transition from mining to agriculture, and strong rivalry existed between the two interests. Because of the slickens from mining operations that were filling Feather River and other streams, raising the water level, and making the danger of floods more imminent, agriculture was regarded by the far-seeing, as the future industry of Butte County, even though expensive mining projects were still under way. One of the most spectacular was the building of a rock wall in the center of Feather River, its purpose being to divert the stream so that sponsors of the project could walk in and pick up the nuggets with which the river bed was supposed to be paved. However, gold was not procured in paying quantities; but the wall still stands, a picturesque monument to the enterprise.

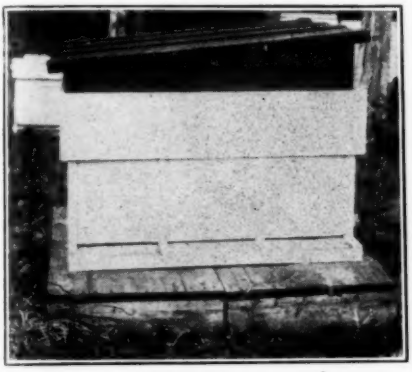
Meanwhile men who had sold for vast sums the privilege of dredging large areas of valuable land, after squandering the fortunes thus acquired, were now clearing away the mountain of debris in an effort to reclaim their land for the planting of orange and olive groves.

When the first of these groves came into bearing on a commercial scale, Robert, a boy of fifteen, back in Ohio where the family had moved from Vermont, was happy with his first colony of bees. It was a late swarm, a gift from a neighbor beekeeper, who warned him that it would have to be fed to build it up sufficiently strong to live through the winter. Never have bees received such solicitous care; but the family moved away and young Williams reluctantly parted with his treasure, returning the bees to their original owner.

Then followed a period of apprenticeship as a watchmaker in the shops at

Waltham, Massachusetts, where he had a second opportunity to work with bees. A. W. Small needed a strong arm to assist him in his apiary on Saturday afternoons. His bees, strange to relate, were kept for the purpose of raising cucumbers instead of honey, but that did not detract from their interest to Robert Williams. Rather it added to his fund of gradually accumulating information concerning the usefulness of the honeybee generally, and its indispensability as a pollen-bearer for trees, shrubs and vines.

The secret of producing hothouse vegetables commercially was revealed to him. There must be quantities of bees on hand to do the pollenizing work at a season when apiaries in that cold climate were still swathed in their winter cov-



Three colonies in one hive separated by queen-excluders. One way of producing strong colonies for pollinating cucumbers in February.

erings. To that end the bees must be built up and put away in the fall in the strongest possible condition. This was accomplished by means of using a large hive constructed of three eight-frame hives placed side by side, separated by queen-excluders in place of the sides of hive bodies, thus combining the strength of three colonies under one cover. The following February the bees were rented at the rate of ten dollars a colony for the season to the producers of hothouse cucumbers, bees and equipment to be returned to the owner after the pollenizing season was over. The bees were placed in the hothouses where they immediately became very active, their flight being circumscribed to the confines of the building. Even though they might have escaped through ventilators, the temperature in February was too low to attract them outside.

Family fortunes again interrupted this fascinating pursuit and brought Mr. Williams with his wife and daughter to the Pacific Coast, where his third venture in bees was staged at Tacoma, Washington. He again assisted a beekeeper, and his compensation for making up the season's equipment was ten frames of brood, to which he added five queens from A. I. Root's Italian strain. This innovation was regarded with suspicion by his employer, whose bees were black. He complained that the new bees were stealing all the honey from his own hives. Mr. Williams settled the dispute by moving his five nuclei to a safe distance.

By generous feeding which was necessary on account of the inclement weather he was rewarded with five strong colonies. These brought fifty dollars when sold along with other possessions to answer to a call to California.

Modern Alchemy That Really Produces Gold.

Bees and orange bloom! Was there ever such a combination? For weeks after his arrival in Oroville Mr. Williams spent all his spare time driving over the hills selecting locations for the colonies that one day were to be his. Even at that time, 11 years ago, the orange groves were attracting beekeepers in large numbers, but he soon discovered they always moved away after the orange bloom was over and gathered their main honey crop in other sections of Butte County and even in other northern California counties where the star thistle plant holds sway.

A man chained to a watchmaker's bench was hardly in a position to follow bees around the country, so for five years Mr. Williams hesitated to take the plunge. He finally decided to experiment with one colony in his own dooryard and, if it made no surplus honey for his time and trouble, his investment would not be of serious moment.

A hive, super, foundation, etc., were purchased and made ready for occupancy; but fate again intervened. The family went back East and the hive was sold before the paint was scarcely dry, thus closing the fourth chapter of beekeeping history.

However, the trip proved to be only a protracted visit and within a year they were again settled in Oroville, California. One day while dining with a friend, Mr. Williams noticed a colony of bees in the garden, the hive strangely resembling the one he had sold and for which the purchaser had forgotten to send his check.

"Where did you get those bees?" he inquired of his host.

"A man hived a swarm and never came back for it. I wish you would take it away. Bees are a nuisance to my family."

Take them! Mr. Williams needed no

second invitation. There was his own hive filled with bees. The alternative was either to claim the hive and turn the bees loose, leaving a set of combs filled with honey and brood of no value without bees, and which by rights belonged to the bees themselves; or to run the risk of losing both hive and bees by notifying the purchaser of the hive who would immediately pay the five dollars due when the matter was brought to his attention. He did not debate the question long. He wanted that colony more than anything else in the world. To him they represented all the freedom of outdoor life he had unconsciously craved during the years spent in factory, shop and store. He simply must take them bees. He planned to increase solely by natural swarming and to make each new colony stand on its own bottom financially, each year's return being invested in equipment for the next season.

Initiated in the Mysteries of American Foul Brood.

All went merry as a marriage bell until he was tempted to purchase the bee equipment of a deceased neighbor, whose bees "hadn't been doing so well." Alas! the bees were also deceased, and after shaking 20 colonies out of a total of 30 housed in the infected equipment, Mr. Williams decided that foul brood, heretofore unknown to him except through reading, was all that the books said, and more.

Apiary of Robert Williams, Oroville, Calif., set in a frame of blooming orange trees.

if for no other reason than to accommodate a long-suffering neighbor by eliminating a nuisance from his garden.

Thus fortifying himself, Mr. Williams, like many a frontiersman before him, held court on his own account, and in the capacity of both judge and jury, awarded the property to himself and moved it out of the jurisdiction of the erstwhile purchaser of the hive.

In spite of dire predictions of his wife, who was for "law and order" in all things, the colony throve as never bees throve before, although she still maintains that it was because Mr. Williams, after the first excitement of possession subsided, did notify the purchaser, who relinquished all claim to the one-stand apiary. Over 100 pounds of comb honey was taken from it the first year, and that without the use of the migratory methods of his neighbor beekeepers.

Encouraged by the returns, Mr. Williams began for the fifth time to keep

Every California beekeeper must be initiated in that regard sooner or later, and Mr. Williams was fortunate to have had his experience in time to move the shaken bees to a star thistle pasture and secure three tons of honey. This he disposed of locally through his own and other stores.

While the front end of his new store is devoted chiefly to rings, diamonds, cut glass and other articles pertaining to a honeymoon, in a back room the visitor will find honey minus the "moon," in every practical form for handling by wholesaler, retailer or individual consumer.

As a business man, Mr. Williams eliminated the word "failure" by eliminating the conditions that so often cause failure. The same practical sense that brought him from a watchmaker's bench to a jewelry and optical store of his own, was apparent during his term of office as president of the Butte County Asso-

ciation of Beekeepers; also in his invaluable work as deputy inspector of Butte County when launching the campaign to clean up the Oroville district from disease, that had secured a stranglehold on the bee industry throughout Butte County, and again in the conduct of his own apiary, which now numbers 50 colonies.

He refuses to operate a larger number of colonies than can be gone through or worked on Sunday, his only free day. For whatever is left over from that day's work must go until the following Sunday, and some bee work refuses to wait, especially in swarming season.

That is why on Easter Sunday he was to be found in his beeyard, its framework of blossoming orange trees a setting fit for a worshiper of "God of the Open Air." Having finished a minute inspection for swarm cells, he was free for the day and ready for a drive around the hills to visit the locations of transient beemen, the number of whose colonies surpasses the records of all previous years, and is a serious menace to surplus honey on account of overcrowding the pasture. One beeman offered to wager that there was a bee for every orange blossom. He had no takers.

Transit Apiaries on Historic Ground.

The old diamond mine that in the early days had attracted scores of adventurers, its machinery broken and rusted, is now surrounded by millions of winged adventuresses on plunder bent, filling the orange-scented air with their incessant humming; an abandoned orchard is occupied by another apiary; the grounds of what must have been a magnificent estate, entirely surrounded by a high hedge of roses evidently having run riot since the days of '49, is the site of a third; a sloping pastureland, with here and there stray boulders from some old mining enterprise, was selected by still another beeman; and overlooking all is "Table Mountain," its vast, flat banquet board a perpetual invitation to Olympian Gods to take possession and, with Robert Williams and his bees in the valley below, partake of the incomparable feast of northern California's gold distilled from her sunshine, winelike air and honeyed nectar.

Chico, Calif.

LEARNING AND UNLEARNING

By Leslie Burr

Observations and Experiences with the Brood Diseases of Bees in Various Parts of the World

Lucky is the beekeeper, as a rule, who has never had to contend with the brood diseases. To my mind there is nothing that can take the joy out of beekeeping more effectually than the finding of an apiary infected with one of these diseases. Poor seasons come, but they pass on of their own accord, and, while they may cause disaster, there is a clean basis left on which to build. The same is more or less true of other ills of the apiary with the exception of foul brood. In fact, I doubt whether any disease that attacks either man or beast, when left to itself, can more thoroughly wipe out the life of a community than can foul brood in an apiary.

My first experience with American foul brood was about the year 1896, and since then I have met it almost everywhere I have been with the exception of the Hawaiian Islands.

One of the interesting things to me in connection with the disease has been the manner in which different beekeepers react when confronted with the existence of foul brood among their bees. To the person interested in psychology such beekeepers furnish considerable material for study. Of those who have failed successfully to combat the disease, a number of reasons for the failures exist.

To my way of thinking the most hopeless of the class are those who can not, or will not, believe the known facts concerning foul brood and its treatment. For example, I recall an instance in southern California that occurred a number of years ago. I was present when two beekeepers were discussing American foul brood, which had recently made its appearance in the neighborhood. To me, the source of infection was plain. It had existed for some years but a few miles away, and had progressed across the country until the apiaries of the two beekeepers in question had become infected; but this fact was not recognized by them.

One had the idea that his bees had contracted foul brood from stagnant water. There had been considerable rain that year, and a pool of stagnant water had existed for a time near the apiary in which the disease made its appearance, and he "just knew" that the stagnant water was the source of the trouble.

The other beekeeper admitted that there appeared to be no doubt that the stagnant-water theory was correct, but that it would not account for the origin of the disease among his bees, as they

(Continued on page 388.)

CONTROL OF AMERICAN FOUL BROOD

By Dan H. Jones
Professor of Bacteriology Ontario Agricultural College

Summary of Some Laboratory Tests with Various Disinfectants in this Disease

[The bacteriologist is able to grow the germs that cause American foul brood. He plants the seeds (spores) in a suitable soil (culture medium), surrounds his little garden with the proper temperature and moisture conditions, and then by means of the microscope he watches the growth of the tiny microscopic plants in much the same manner as a farmer tests his seed corn. This enables him to test the effectiveness of various disinfectants for killing the spores, which by growing and multiplying cause the disease. If after soaking in the disinfectant, the spores, on being planted, are found to grow, he knows they have not been killed; but, if no growth takes place, he concludes that they have. In this article Prof. Jones gives the results of tests of several disinfectants that have been advised for destroying the spores of American foul brood.—Editor.]

Owing to the recent good work of White and Sturtevant in devising a culture medium (yeast-egg-yolk-agar) on which *Bacillus larvae*, the cause of American foul brood, will grow, the bacteriological testing of effectiveness of disinfectants on diseased combs has been made practicable.

In February of this year Mr. Sturtevant, on request, kindly forwarded us his method of preparing this culture medium, and immediately a series of experiments were commenced for testing a number of disinfectants on the spores of *B. larvae* as they occur in the larval scales in combs affected with the disease.

For treatment the affected combs were placed on edge, right side up and weighted down in museum specimen glass jars. The solution to be tested was then poured in and the jar shaken so as to agitate the solution, thus facilitating the displacement of air bubbles from the cells.

Streak cultures on yeast-egg-yolk-agar slopes were made in each case from the larval scales before the combs were treated, then after they had been immersed for 24 hours and again after they had been immersed for 48 hours. Combs were allowed to stay immersed in some solutions for 6 days and one for 18 days.

All cultures were incubated at 37° C. (98.6° F.) and examined daily thereafter up to 14 days before a negative result was recorded. In every examination, whether there was visible growth on the culture or not, smears were made on microscope slides and stained by Gram's method. Where, in the following report, it is stated that growth of *B. larvae* occurred, it means that there was not only typical visible growth on the culture but that Gram's stained smears made from the culture showed typical *B. larvae* in the vegetative condition.

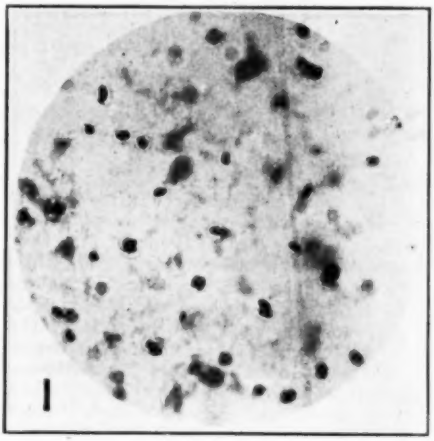
The following disinfectants were tested: Izal, Chlorazene, Be-Helth, Hutzelman's solution and formalin.

Izal.

This is a coal tar product said to have a phenol coefficient of 18-20. It is said to kill anthrax spores in four hours and is used in Great Britain to combat various bee diseases, as it is non-irritant and the bees do not mind its use about the hives. It is used as a general disinfectant in the strength of 1-300 of water.

The following dilutions of Izal were tested: (a) diluted with water: 1-300, 1-200, 1-100; (b) diluted with denatured alcohol; 1-400, 1-100; (c) 1-50 water + 50 denatured alcohol.

Before immersion of the combs, the larval scales in open cells were hard and dark brown; after immersion the scales were soft, pulpy and somewhat ropy, and light brown in color, thus showing that they had been thoroughly soaked.



1. Spores of B. larvae in a smear from an affected larval scale. x1000 (original).

Cultures made from scales from open cells after this treatment showed good growth of *B. larvae* in all cases, even after six days immersion in four cases and 18 days immersion in one case.

Conclusions.—Izal is not effective in killing the spores of *B. larvae* as they occur in larval scales in combs.

Chlorazene.

This is Dakin's new antiseptic and surgical disinfectant, said to have a phenol coefficient of 50+. A one per cent so-

lution was prepared and combs immersed. Streak cultures from scales from open cells were made after 24 hours and 48 hours immersion.

Result.—The scales became soft and pulpy, but good growth of *B. larvae* developed in all cultures.

Conclusions.—Chlorazene, one per cent solution in water, is not effective in killing spores of *B. larvae* as they occur in larval scales of affected combs, after 48 hours immersion.

Be-Helth.

This is said by its manufacturers to be "a special hypochlorite prepared particularly and only for foul brood of bees."

Foul brood combs were immersed in this solution, full strength, and cultures made from the larval scales in open cells after 24 hours and 48 hours immersion.

Result.—Good growth of *B. larvae* developed in all cultures.

Conclusions.—Be-Helth is not effective in killing the spores of *B. larvae* as they occur in larval scales of diseased combs after 48 hours immersion.

Note.—The combs were much blanched and the wax denatured, the cell walls being made friable, causing them to crush badly on being handled.

Hutzelman's Solution.

This is a commercial preparation of formalin and denatured alcohol prepared especially for treating combs affected with American foul brood.

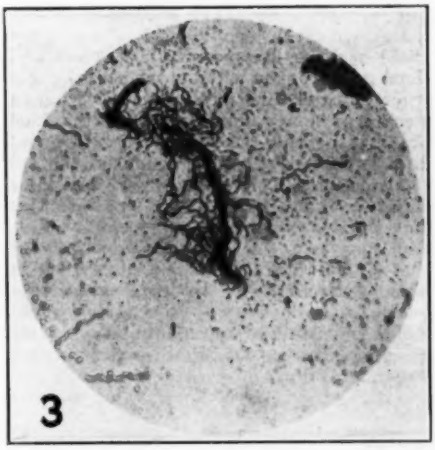
Foul brood combs were immersed in this solution and cultures made from larval scales both from open cells and capped cells after 24 hours and 48 hours immersion.

Result.—All cultures made from open cells after 24 hours immersion remained sterile, thus showing that the spores had been killed. Two cultures out of six made from capped cells after 24 hours immersion showed growth of *B. larvae* on four days incubation.

All cultures made from both open and capped cells after 48 hours immersion remained sterile up to 14 days of incubation at which time it was decided that all spores were killed.

Conclusions.—Hutzelman's Solution is effective in killing the spores of *B. larvae* in 24 hours in foul brood affected combs when it comes in contact with the larval scales as in open cells. In case of capped cells, however, it would appear that 48 hours immersion is essential.

2. B. larvae from culture 6 days old on yeast-egg-yolk-agar. Gram's stain. x1000 (original).



3. B. larvae from culture 5 days old on yeast-egg-yolk-agar; Loeffler's flagella stain. x1200 (original).

Formalin.

The sample used was guaranteed to be at least 37 per cent formaldehyde. This formalin was diluted with water in the following proportions: 50-50; 25-75; 20-80; 15-85.

Foul brood affected combs were immersed in each of these solutions for 24 hours and 48 hours, after which periods cultures were made from the scales from open cells and capped cells on yeast-egg-yolk-agar slopes.

Result.—All cultures made from scales from open cells of combs immersed in any of the dilutions for either 24 or 48 hours remained sterile. Cultures made from capped cells immersed for 24 hours showed growth of *B. larvae* in twenty per cent of the cases. All cultures made from capped cells of combs immersed for 48 hours remained sterile.

Conclusions.—Formalin diluted with water in as high a dilution as 15 per cent

(Continued on page 396.)

EXHIBIT AT OHIO STATE FAIR

By E. R. Root

Complete Process of Extracting and Packing Honey Shown to Thousands Daily. Novel Advertising Stunt

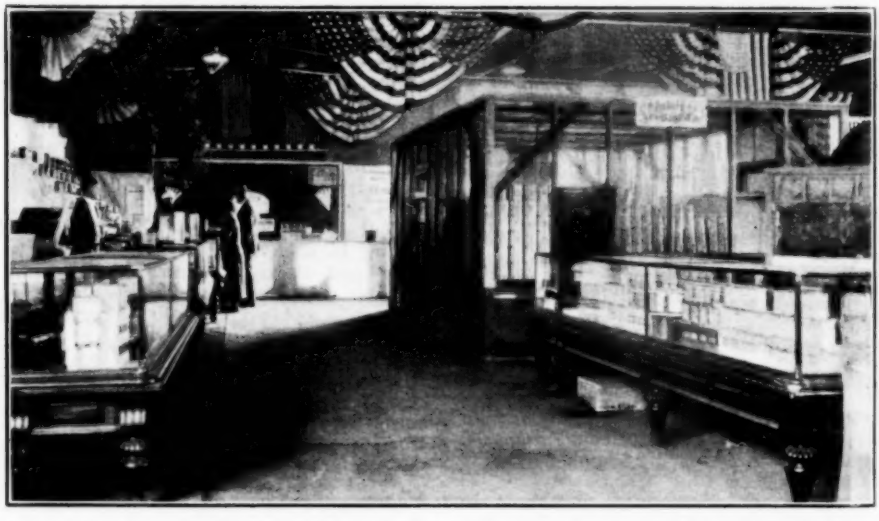
L. H. Benninghof of Benninghof Farm, Columbus, Ohio, put on at the last State Fair a complete exhibit showing the entire process of taking the honey from the hive and putting it in the retail packages—mostly in five and ten pound tins. The exhibit consisted of an inclosed structure covered with wire cloth to prevent any possible robbing. In this was placed a modern power extractor operated by an electric motor, a modern uncapping equipment including a steam uncapping-knife and two 140-gallon tanks. The extractor was equipped with a honey pump which delivered the honey in a stream into the tanks. As the people passed by, they could see the honeycombs uncapped and then go into the extractor, see the extractor whirl and finally see the golden stream of honey flow from a galvanized pipe into the settling-tanks. Zowie! didn't that make their mouths water? They could see the girls draw this same delicious "real bee honey" out into tins and bottles right fresh from the hive. Did they buy? Mr. Benninghof says he sold at his exhibit tons of honey which he extracted right in the extracting-booth, where every one could see it. From seventy-five to one hundred thousand people passed this exhibit every day for six days.

All around this extracting display were exhibits of beekeepers' supplies and honey in both glass and tin. Quite a force of clerks were kept busy in disposing of the honey. Large quantities of literature were distributed, and the educational value of the exhibits was considerable; and, moreover, Mr. Benninghof was advertised as the "honey-man" of Columbus. He is shown on the next page with four of his helpers.

An "Accident" That Helped Advertise Honey.

It was this same Mr. Benninghof who staged an advertising bee "stunt" on the busiest streets of Columbus. He somehow spilled a lot of bees from his automobile on High Street of that city, near the Capitol building where traffic is most congested. From the standpoint of the people on the street it was a purely unforeseen accident. That it was not "unforeseen" is shown by the fact that a tip was somehow given to the newspaper men that such a stunt would come off on such a street. As news was scarce the reporters were out in full force with their cameras.

A whole colony of bees was spilled from a Ford on the street. My, oh my! what a mix-up of men, bees and combs! According to the newspapers it was something "awful." Combs, bees and



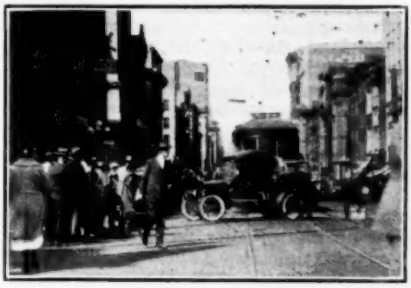
Portion of the bee and honey exhibit at the Ohio State Fair in 1923. The large screen cage in background at the right is the extracting room where large quantities of honey were extracted every day. The entire process of extracting and drawing off into containers was witnessed by thousands of visitors daily during the exhibit.

police were scattered in all directions. Traffic was tied up, and in the mean time Bennie was "jawing" his men for being so careless. What he said was a plenty; but Bennie was not so mad or flustrated as he appeared. If you could have looked close you would have seen a twinkle in his eyes, showing that his plan "worked." It worked a little too well, as the bystanders and the street-car company will assert. Squares of their cars both ways were completely tied up. Moreover, it took a whole squad of police to bring order out of chaos. The police must have a tip, too, as so many of them were on hand.

The extracting crew at the Ohio State Fair bee and honey exhibit. L. H. Benninghof and his helpers.

If Bennie had not had a "pull" with the force he probably would have been "pulled" in a way not to his liking. The reason for this "pull," he says, was this: Any time a stray swarm of bees lands anywhere in the city of Columbus, he is immediately notified by the police department, regardless as to whose bees they are, to come and remove them. On this account he thought it would be perfectly "safe" to pull off this stunt.

This stunt and the newspaper publicity connected with it, followed by the exhibit at the Ohio State Fair, gave Mr. Benninghof a lot of advertising; for, be it known, he sells honey in glass and tin all over Columbus and vicinity.



An accident (?) on a busy corner in Columbus, Ohio. A colony of bees was spilled from a truck at a strategic point which stopped traffic and created quite a stir in the papers.

Most of us wouldn't have the nerve to stage a stunt like this. It would not be well for us if we did; but it proved a case of "all is well that ends well."

Moral. — Don't attempt any such stunt unless you get the consent of the city fathers, the mayor, the chief of police, and then be prepared for a damage suit from some irate citizen who couldn't see the point, even if he did feel it.

Another view of the bee and honey exhibit at the Ohio State Fair. The extracting booth is here seen at the left.

FROM THE FIELD OF EXPERIENCE

VARIOUS SWARM CONTROL PLANS

Carefully Conducted Experiments in Various Types of Location Would Develop Best Method

Many are the plans for controlling swarming when producing extracted honey; but most of them are so imperfectly adapted to local conditions in the maintenance of maximum colony morale that further experiment by those qualified is one of the greatest needs of modern beekeeping.

Experiments should be carefully conducted in widely separated localities, comparing the various plans, from the old plan of breeding from stock selected for generations from the colonies less inclined to swarm than the average, and with such bees, doing little more than giving abundant room in the comb and if necessary, destroying queen-cells, to all the newer plans of raising brood above an excluder, shook-swarming, requeening and mechanical swarming. All these should be tried on such numbers of colonies that some confidence can be placed in the results indicated.

There is no denying the fact, that here and there are successful producers who seldom or never practice the radical and more or less complex methods of swarm control, yet large crops are produced, and apparently with no more labor than when the more radical methods are used, if as much. Notable among the extensive producers of extracted honey who resort to simple queen-cell destruction, with abundant room in the combs and the giving of the minor requirements such as sufficient ventilation, etc., are R. F. Holtermann and Morley Pettit. There are also some extensive producers of comb honey who practice the same plan very successfully, who never seem to be so hurried as do some who practice the more radical methods, and certainly their crops are excellent in both quantity and quality.

In theory, the more radical methods would appear to be much better, for, if successfully worked out for the conditions in a given locality, the swarming impulse is at once done away with or satisfied. Where this is successfully accomplished, the results are usually very good, and no further attention need be given to the brood-chambers of such colonies during the season provided all is as it should be at the next trip after the treatment. But there is the rub. Not at all is it true that the radical plans of swarm control are uniformly successful. The variation in colony condition at the time of treatment, together with the variation of seasonal conditions within the next ten days, may render of no avail the treatment given. Not that swarming may not be controlled, but colony condition and colony morale may be rendered far worse than if no treatment other than the destruction of queen-cells had been given.

During June, 1923, we made enormous shook or mechanically forced swarms with the intention of producing comb honey; then the weather conditions changed for the worse. Of many such swarms made, only one was found working freely in the comb-honey supers at the next trip to the apiary. In other years, such big forced swarms have been made at the opening of the alfalfa flow, and cool cloudy weather followed, with a rapid aging of the fielders resulting in very little surplus being gathered. In fact, the apiary would have been in better condition had more conservative plans been followed.

Demareeing has doubtless been applied to thousands of colonies when the weather conditions that followed were such that the queen put below the excluder on a frame or two of brood did not lay freely, the field force and nurses virtually abandoning her. This results in a dwindling colony and a materia' reduction of the crop from any later honey flow. On the other hand, under well-worked out radical plans of swarm control such as these, if the weather remains good very large crops may be taken. An immense force of satisfied bees sometimes work with far more vigor than the bees in colonies not so treated. In fact, my largest crops have been from such colonies.

I believe it was Professor Park, then of the Iowa Agricultural College, but now connected with the Illinois University, who found in carefully conducted experiments, that Demareeing reduced the yield from colonies (one season at least). M. H. Mendleson of Ventura, Calif., insists that his helpers maintain a "compact brood-nest." For average conditions in the average northern locality, this advice is good, unless the beekeeper feels quite sure that very favorable weather will follow the opening of his honey flow.

A few producers hereabouts insist that they have a strain of bees much less inclined to swarm than the average. These men are not users of large hives. They admit, however, that when everything is favorable for swarming, as in some ex-

ceptional seasons, even these bees will swarm. I have known at least two beekeepers who ran an apiary for extracted honey for one or more seasons, without any colonies trying to swarm, and the hives were ordinary eight-frame size, though the bees were, in both instances, I believe, of the strain referred to above. So persistent have been their claims that we are giving this strain a trial in our own apiaries.

After actual experience with hives of various shapes and capacities, I doubt, for the average northern locality where pollen in the spring is reasonably abundant, that the size of hive has much to do with swarm-prevention or control. While in the large hive the queen usually has abundant room for egg-laying, if the combs are of good quality and not honey nor pollen-bound, yet in the large hive she will all the sooner reach and pass the "peak" of her egg-laying powers, and then, if conditions remain favorable as regards honey and pollen supply, they are very likely to prepare to swarm.

Some seem to think that we have about reached the ultimate goal of swarm-prevention or control, with colony morale maintained at its maximum. For conditions in some few localities, this may be true, but for the greatest number of localities, especially in the northern states, we have only begun to adventure on the path leading to the largest crops from a given number of colonies. Each qualified reader can do nothing of greater service to beekeeping than to join in the search for simpler methods which will, at the same time, stimulate colony morale to the utmost and eliminate all swarming.

Meridian, Idaho. E. F. Atwater.

PECULIAR CASE OF POISONING

Heavy Loss of Bees in Southeastern Nevada. Supposed to be Caused by Loco Weed

For three years in succession I have built my bees up and had them in condition so that they should have made a wonderful lot of honey, only to have everything nipped in the bud by a severe case of poisoning, with the bees left weaker the middle of July than they were when spring started. As I had never read nor heard of the loco being a poison plant and as there was no spraying nor artificial poisoning of any kind, I was at a loss to diagnose the trouble. In the first year's experience with it I had about 140 colonies, spring count. Eighty of them were full colonies, very heavy with honey and with queens that had seen a full season's service. The remaining 60 were just nuclei but with young queens in each of them.

The 80 full colonies built up in the spring until they literally boiled over with bees, and commenced to bring in honey at a time when it seemed there was nothing to work on. I did not find them working the loco that year at all. But at this time, which normally should been swarming time, the queens quit laying and never started again. A few colonies started queen-cells but only a few. In the rest, the queens simply quit with no cells started. I noticed also at this time much of the brood in emerging would gnaw off the capping, protrude the tongue and perish remaining in the comb. The colonies then dwindled faster than I've ever seen elsewhere. Within a month they were down to handfuls, and within six or seven weeks I think I had about 15 nuclei left out of the 80 full colonies.

Of the 60 nuclei about 45 survived. As mentioned above, they had young queens reared the summer before that had seen very little service. These young queens quit laying for over a month, but did not disappear as did the old ones. They may not have got quite so bad a dose of the poison. The brood died in the combs —some of it so that the combs were barely fit for use. However, these 45 survived and in July were building up again. Before fall they had made two cans of honey apiece and about an average of 50 pounds each for winter.

There were none of them that raised a queen, nor did I have any success with some nuclei that I set out, all of which I laid to the bee martins. The queens that stopped laying I could not account for.

The second spring I had about 50 full colonies after disposing of a few with poor queens. These 50 I encouraged to build up as quickly as possible in the spring, and as fast as the queens started to fail I killed them and divided the bees into nuclei.

I did not yet realize that my bees were getting poisoned from some source but seem to have adopted a method by good fortune alone, which rather got around it. I divided the 50 colonies, spring count, into 240 nuclei and could have stretched the number further; but in the last ones formed the queens either did not mate or would take 21 days or longer to do so. In fact, of the nuclei made last practically none went to laying and out of the 240 divisions I united back to 165. These, as I said, were made early. The middle of June, which was about the close of the loco bloom, they averaged three or four frames with sealed brood and looked fine. In fact, the loco bloom for a while seems to build them up as well as any other honey flow.

Then the queens quit laying and did not do any more laying for at least a month. The brood died in the combs the same as the previous year and the bees themselves seemed to be very short-lived, for by the middle of July they had gone down to handfuls again. They then built up good and strong for the winter and made about 120 cans of honey.

The spring of the third year I made 80 nuclei which, with what I had, would have been close to all the bees there was range for; but I made them late and of the 80 I think about five queens went to laying. The loco bloom was extra heavy that spring and at last I decided that it must be the loco as there does not seem to be anything else that could be causing the trouble. For a while it looked as though the bees were going to be wiped out entirely. However, about 100 barely survived out of the 240, and they had only a handful of bees.

I think there are two ways of getting around the matter. One is to make all increase in the fall and put all of the bees in one location where there is as little loco as possible. Putting them all in one yard would cut down the percentage of poison each one could receive. It would also probably be well to feed at the critical time. The other recourse is to move them away from any loco and then haul them back afterwards; but, as this involves a long haul, it would be expensive.

Two facts seem to be pretty clear to me. One is that no queens can be raised while loco is in bloom or for a long time after with bees that have been locoed. The other is that the young queens can be raised while loco is in bloom or for a long time after with bees that have been locoed. The other is that the young queens seem to survive even a very heavy dose of it and that the old queens do not. A peculiarity seems to be that the bees do not seem to show the effects of the poisoning until after the loco has quit blooming. I understand the poison acts very slowly with stock.

Alamo, Nev. Timberline Riggs.

[A large number of plants in the West are called "loco weeds." Most of these suspected of being poisonous belong to the family Leguminosae, to which belong also alfalfa, peas and similar plants. The loco plant referred to by Mr. Riggs is probably the blue loco or "rattleweed" (*Astragalus diphysus*) which is found chiefly in Arizona, but extends into the adjacent states. This plant is poisonous to horses, cattle and sheep. The peculiar slow effects on the bees described by Mr. Riggs suggest that the pollen of this plant may be the source of the trouble instead of the nectar.—Editor.]

OUTYARD SWARM PREVENTION

A Simple Plan that Works Well in Alfalfa Region of Kansas

In working one yard of bees at home, there is hardly a day but that we are doing something to some of the colonies. Many beekeepers keep a very complete record of the condition of each individual colony and make a note of what they will do to this one today, the next one tomorrow, and some other one the day after. I know, because I have done it myself. It is a part of the development of a beekeeper. But home-yard methods will not work in the outyard. When we are working one yard of bees at home, every individual colony is a unit. When we establish outyards the yard becomes the unit, and we work the yard, not the colonies.

The object of the first visit to the yard in the spring is to see that each colony has a laying queen, plenty of stores for spring brood-rearing, and to dispose of dead and queenless colonies. Before leaving the yard on this first visit we make sure that every colony contains a laying queen and plenty of stores to last until the first alfalfa bloom, which comes some time in May. When the yard is left in that condition there is absolutely nothing more we can do for the bees until they are beginning to feel crowded.

The second visit comes as the first alfalfa bloom is beginning to appear. It has but one object—to prevent swarming. Swarming occurs while the colony is in an unbalanced condition as a result of its rapid spring growth, but the impetus that actually sets it off is usually one of the minor honey flows. With us this is the first alfalfa bloom.

Some years ago I broke into the pages of the A B C and X Y Z of Bee Culture with ten slatted dividers just the size of a brood-frame. These were alternated with the brood-combs, spreading the bees out evenly through two stories instead of one. It was an attempt to apply the Aspinwall principle to the standard hive. Of course, I was more than pleased to have my slatted dividers illustrated in that book, and had to buy an oversized hat as a result. The last edition, however, contains no mention of them, and the swelling is considerably reduced.

After watching the action of strong colonies that had been spread by slatted dividers and forced to occupy two hive bodies instead of one, it finally dawned on me that the same thing might be accomplished by alternating the brood-frames with frames of foundation or drawn combs. That was more than 10

years ago, and in all this time I don't believe I have had a dozen swarms from colonies that were so treated.

In applying the method we go to the yard a little before the most advanced colonies may be expected to feel "broody," and start queen-cells. The alternating of all the frames of brood with frames of foundation or empty combs must be done before any cells are started, not afterwards. It is an out-yard manipulation that absolutely gets results.

Strong colonies that were wintered a story and a half high will at this time have practically all of the space, that is not occupied with pollen and honey in both the hive body and the shallow extracting super, filled with brood. They have reached the danger point. They must not only be given more room but must be forced to occupy it, and to occupy it right away. The only method that will force a colony to occupy an additional hive body completely at the time it is given is to alternate the empty frames of the hive body we are giving with the frames of brood in the old hive body. This spreads the bees out evenly through the two hive bodies and a bee can't sit down any place to meditate without an empty comb staring her in the face. It completely breaks up swarming. Weak colonies should not have their brood-combs alternated but should be given an extra hive body in which are placed two combs of brood.

In case any of the colonies have started queen-cells it will be the stronger ones, and we are almost sure to find these cells while alternating the combs. When queen-cells are found we shake the bees upon foundation or empty combs or both. These shaken swarms are given two hive bodies. One or more frames partly filled with honey are given to each to tide them over any bad spell of weather that might prevent them from going to the field for nectar.

When we leave the yard on this swarm-prevention trip, every colony has been treated in a way that is reasonably sure to prevent swarming, and has been given enough storage room to last until the main honey flow is on. With us this comes from the second alfalfa bloom, which opens between the 15th and 20th of June.

Any manipulation that relieves the congestion of the brood-chamber reduces the swarming tendency. By alternating all of the combs of brood with empty combs or frames of foundation, the congestion is practically done away with and the swarming is almost eliminated.

Augusta, Kan. A. V. Small.

WATER METHOD FOR INTRODUCING

Wetting Down the Bees as Well as the Queen for Direct Introduction

My method for introducing queens is not a new one, just an old English method. It is called the Water Method. The old way to use this method was to kill the queen in the colony to be requeened, dip the new queen into warm water and shake her around until she is thoroughly wet, open the cage and allow her to crawl down among the bees in the now queenless colony, then place the cover on the hive and forget it till the next time you want to examine it.

This method will work sometimes, if there happens to be a good honey flow on and every thing else is just right; but I found that it is not always perfect. So I made this little change in procedure, which I find makes all the difference in the world with the success of the plan.

Go to the colony to be requeened, taking with you a new queen and about two quarts of water (not too cold). Open the hive and remove the old queen; then smoke the bees just enough to drive the most of them down below the top-bars and proceed to wet the bees by sprinkling over the top-bars. When the first water hits them they will generally set up quite a roar, so just keep on sprinkling them until they quiet down. Don't be afraid of using too much water; it won't hurt them if the hive is set with the entrance lower so the extra water will drain out. Next, dip the new queen into water, cage and all. She won't drown. Get her wet, then remove the screen from the cage, letting the queen crawl down among the already wet bees. After you are sure she has crawled down among the bees, put on the cover and mark that colony requeened. If the colony be more than one story, be sure to wet the bees in the supers before putting back on the brood-chamber.

Water will not hurt the queen, brood or bees if not cold enough to chill them; so I consider that this method is not cruel. Speaking of cruelty, how about taking a heavy laying queen and caging her for several days before the bees set her free? Is it not more cruel to shut her off from heavy laying all at once than to give her a warm bath which will keep her wet only a few minutes, when she can and will go right on with her egg-laying as though nothing had happened.

Some will say this is not natural. But is it not more nearly natural than killing a queen in a colony, then caging a new one there for several days? Not only do you stop her laying, but also there are

no eggs being laid in the colony in which she is caged. Is either of these natural? It is not. With my method the new queen in many cases will be laying within an hour after she is introduced. That is the reason the bees accept her so readily, for the water gives them all the same odor, and when they get dried off they find a queen going on with her work just as things should be. So they can't see that anything has happened but a heavy rain. In a very few minutes after the bees have organized after their bath, you can go back and manipulate the colony just as usual. Are there any other methods in which you dare go back and work the colony in so short a time?

This method is simple, and I have found it to be so nearly perfect that I call it 100 per cent. Think of the time in egg-laying that is saved, also! Of course, if a queen comes through the mail, the chances are she will not commence to lay for several days; but if you can get your queens nearby or raise them yourself, this method is a time saver. We have requeened hundreds of colonies by this plan and have lost very few. Now we use this method most of the time. W. L. Bell.

Orange, Calif.

USE AND ABUSE OF EXCLUDERS

Conditions Under Which Queens Stay Below When Excluders are Not Used

In the January issue, page 10, I note the Editor's remarks regarding the use of the second story by the queen. With me, and I think generally in Australia, the queen is given the full run of the whole hive whether two or four stories.

Any well-bred queen will preferably keep to the lower story, and it is only when crowded for room that she goes to the second one. It is quite common for the second story to contain up to six or seven combs or brood while the lower one is full; which goes to prove that 70,000 cells are not generally sufficient for the laying capacity of the average queen.

Forcing the queen down with an excluder would not work at all where there are a number of out-apiaries, because it would produce a large number of swarms, which no one would be on hand to attend to, and also it would take a lot of time which could not profitably be given.

I fail to see what advantages there are in crowding the queen down with an excluder, but I can see many disadvantages.

In my opinion, excluders, except at certain short periods and for certain jobs, are a mistake and are never needed. I am not producing comb honey now; but for about 20 years I produced 14,000 sections a year and never in all that time used an excluder. At the same time I never got any pollen in the sections and only on two occasions did the queen go above to lay. My experience is that bees will not store as much honey if they have to climb through an excluder as they will if they do not have to do so.

Major Shallard.

Leichhardt, Australia.

[Major Shallard's statement that "any well-bred queen will preferably keep to the lower story" will be a surprise to many in this country, especially in the North, who are accustomed to seeing queens desert a lower story still containing unfilled combs for the second or even third or fourth story, resulting in the combs in the lower story being clogged with pollen at the close of the honey flow. Locality apparently has much to do with this difference in the behavior of the queens. In this country excluders are not needed in some localities where the main crop is gathered from fall flowers and under some conditions in the alfalfa region where the honey flow is comparatively slow but of long duration, for the queen is then crowded down by honey in the upper portion of the brood-chamber. In localities having an early honey flow the queens in most strong colonies will go into the extracting supers unless kept down by excluders, especially if the combs are perfect so there is no rim of honey between the brood-chamber and the supers. For comb honey, of course, excluders are not needed except when hiving swarms on frames of foundation only. (See also editorial pages in this issue.)

In this country, as a rule, the queen is not confined to the lower story by an excluder until after the peak of brood-rearing in the spring. At this time the queen of her own accord reduces the number of eggs she lays daily so that less room is needed for brood.

It is possible to have 16 or 17 combs that appear to be fairly well filled with brood, and still not have more than 70,000 cells of brood, for many cells contain pollen or honey and many others are vacant. In estimating the number of cells of brood, many errors are made in not making sufficient allowance for the cells which do not contain brood. Those who take time to measure carefully the portion of the combs containing brood or actually count the cells of brood in a strong colony are surprised how far short the count falls of the estimate based upon the total number of cells in a comb.—Editor.]

SIFTINGS

by J. E. Crane

The editorial, "Experiment in Cellar Wintering," as given on pages 282 and 283 of April Gleanings, marks a distinct advance in our knowledge of wintering bees. We guessed before, but now we know the value of careful handling in placing bees in winter quarters, and every beekeeper who winters his bees in a cellar should be duly grateful to M. J. Deyell for this careful experiment. How simple it all is. Instead of guessing from year to year, Mr. Deyell just tried it out, and now we know.

* * *

A 15 per cent loss of honey and a 20 per cent loss of colonies as the result of rough handling seem like a pretty heavy tax to pay for a little careless, hasty handling of bees in autumn. It would be surprising if the lower vitality of the eight colonies that survived the winter would not prove a greater loss even than the two dead colonies.

* * *

Leslie Burr's methods of saving one's strength, as given on page 298, is well worth the careful attention of every one who does his own work among his bees.

* * *

An old proverb says, "A little knowledge is a dangerous thing," and so it would seem after reading the editorial, on page 283 in regard to Dr. Brady's ignorant assertions as to the adulteration of honey. Many years ago a small boy came to visit me as I was opening hives. He came and stood in front of a hive and, swinging his arms, said, "I know all about bees," when much to his surprise a bee planted a sting in his face. Very soon he had a more humble and modest knowledge of bees.

* * *

Every beekeeper who reads Dr. Brady's article on the adulteration of "extracted or strained honey" should "sting" the editors of such papers as know no better than to print such nonsense. Beekeepers should follow the advice of the Editor to write to them and tell the newspaper men the folly of printing such stuff until they are ready to apologize and rectify their blunder.

* * *

Yes, "A little knowledge is a dangerous thing." Geo. H. Dacy has written up the "United States Bee Farm" as the leading article for the Popular Science Monthly for May. Some of his statements are at least novel if not true; for instance, he says, "The bee can not see for more than a few feet." It finds its way back to the hive by some super sense unlike any possessed by man. Again, "Each bee has its own place in life, and its life work is appointed at birth. Moreover, whether it be honey gathering, sentinel or comb builder, the bee never attempts to change its occupation nor rise beyond its station."

He tells us further that bees are so fond of their home that "if eggs are taken from one hive and hatched in another, the young bees will return to the original hive as soon as they are able to fly." This will be news to some of us old beekeepers who, for the past 40 or 50 years, have been removing combs of eggs and brood from strong colonies and giving them to weak ones to build them up.

* * *

"Learning and Unlearning," as Leslie Burr says, seems to be the beekeepers' method of progression. And now comes John Anderson from far-away Scotland to tell us that bees are unable to digest starch that was so highly recommended 50 or 60 years ago, and so I take down my memory book and write down, "No good, tried and found wanting."

* * *

"Bees in Fruit Pollination," by Roy Hutson, beginning on page 290, is another interesting chapter on the value of bees in the deciduous orchards of our country. While the facts are not very different from those heretofore made, they were on a larger scale and more conclusive. Already intelligent orchardists in all parts of the country are calling for bees during fruit bloom. Even here in New England, where we used to hear complaints of bees injuring fruit, we are now getting orders for bees to set in orchards during bloom.

* * *

That new bulletin on the "Growth and Feeding of Honeybee Larvae," mentioned on page 281, is of more than usual interest to thoughtful beekeepers. The rapid growth of the larvae seems almost like a miracle, and the number of visits of nurse bees to eggs and larvae daily is almost beyond belief. Many times I have opened hives when honey was plentiful in the fields, and found so many bees on the combs that I thought them lacking in ambition or actually lazy. I wanted to shake them off the combs and tell them to go to work, forgetting the number of bees required to look after the tender baby bees.

FROM NORTH, EAST, WEST AND SOUTH

In Southern California.—April came in with showers the first few days, and the weather has been rather intermittent throughout the month. It has not been just what one would want for the best results from the orange bloom. The nights have been quite cool, as a rule, and many times it has remained cool all day.

A number of people have spoken of seeing bees crawling around in the grass unable to fly. The loss of field bees has been very severe, and it is only the very strong colonies that have been able to store honey of any consequence. There have been seasons when even the weak colonies stored surplus from the oranges, but not this year. The small colonies do not seem to be able to gain in numbers, and many beekeepers say that the strong are getting stronger and the weak are getting weaker all the time. There is an occasional beekeeper who will get a satisfactory yield from the oranges, but they are few and far between. Some say that the oranges will yield for 10 days yet, while a few think the flow may last a month.

The sages have made only a very small growth in most places, and very few beekeepers anticipate anything from that source. The wild buckwheat may give us some honey, but as yet that is problematic.

Our rainfall is now at or near the record for last year over most of southern California; but that is only a little over half of what we need to insure a bountiful harvest.

Very few beekeepers will need any supplies, as there are so many empty hives that it will take much effort even to get the apiaries back to the numbers there were last year.

The Riverside County Beekeepers' Club held a special meeting on April 23, at which time the principal topics for discussion was queen-rearing and increase. J. Epstein was the principal speaker. He is a man who has been very successful in rearing queens and making nuclei. He has also very successfully shipped bees between California and Utah and Idaho. He had with him all of the necessary paraphernalia excepting the bees for illustrating his methods. A few of the high points of his talk were plenty of feed at all times, plenty of bees and bees in the proper condition for cell-building. A division-board feeder is used. One-third water to two-thirds sugar is the proportion for feed. Two colonies for starting the cells and six for finishing furnish him all of the queen-cells that he needs, and he usually makes from three to eight hundred increase.

We spent the day recently among the back-country beekeepers and found them to be a good-hearted, jovial bunch of fellows ready to feed you on the fat of the land and visit as long as you like. Very few of them knew anything of the condition of their bees. When we drove up, we were likely to be received something like this: "Oh, ho, that is the bee inspector. Say, I'm glad you came. I have not looked at my bees this spring. I have been too busy." How many were dead, how many diseased or whether any were turned over by stock or covers were off, they knew little or nothing about it. It is a wonder some of those fellows ever made a honey crop. Some of these apiarists have good up-to-date equipment, but a goodly number still have hives and frames that are not standard.

L. L. Andrews.

Corona, Calif.

* * *

In Utah.—The conditions in Utah during March and April were very backward. There was no new pollen until April 20, and but very few days when bees could fly; this was favorable in one way, as it conserved the strength of the old bees and saved stores until some new honey was coming.

The willows are yielding quite well, but dandelion is not yielding on account of dry weather, and unless rain comes soon its season will be short. Fruit is just coming into bloom and breeding is going on rapidly, but many colonies are just living from hand to mouth. Usually there is plenty of nectar coming in to keep bees breeding until alfalfa blooms; but this year, unless rain comes soon, I expect to see two weeks of dearth before alfalfa bloom.

Alfalfa never looked better than at present. There is plenty of deep moisture on the dry land, and there will be plenty of water for irrigation for the irrigated lands; so, if we can get the bees in condition for the honey flow, I see no reason why we should not get a crop of honey. In the event of a heavy honey flow, I think I would rather have the honey that will go to waste than what will be gathered, as the quarantine placed on bees from California, on account of the dreaded foot and mouth disease, will keep many carloads from coming here after the orange flow in California. It works a hardship on the

beemen in California, as the outlook there is not the best. Since Arizona, Utah, Idaho and Montana have placed a ban on bees coming into these states, it places a handicap on our friends in California, who could help to save some of the honey that will go to waste, besides helping them to bridge over their own bad conditions.

It is to be hoped that this scourge can soon be overcome, as it would be a terrible calamity to have it spread over these states from which much of our meat supply comes. Everything possible is being done to prevent its spread; even tourists are being met at the state lines and themselves fumigated and their machines disinfected.

We are going to have a busy season with 500 colonies working for comb honey and 200 for extracted honey. Besides, wife and I celebrate our fiftieth wedding anniversary the 24th of this month. The seven children are all coming home that day, so we must take a day off. Standing at this mile-post in life we look back with few regrets and to the future with less trepidation than those who look without hope. We can not agree with some that old age is a tragedy, for we enjoy life as never before. I tell the good wife, who has gotten my three meals a day for 50 years, that if I were she I would consider myself a sort of burnt offering; but when I see her beautiful hand paintings and the dinner table decorated with beautiful flowers of her own raising, it is an inspiration to try to live another 50 years.

Hyrum, Utah. M. A. Gill.

* * *

In North Carolina.—There is every indication at this time (May 6) that this will be the biggest honey year, at least for eastern Carolina, in recent years. While the season is not nearly so far developed in the western section of the state, there is every indication that this and the central section will show up fully as well. The plants seem to be fully two weeks later than the average all through the state. Just now the holly is providing the most worked bloom hereabouts. This will be followed closely by the tupelo and other lowland gums; then by the gallberry and a variety of other flowers that close the spring honey flow the latter part of June.

Eastern Carolina beekeepers are dependent almost entirely on the wild flowers for their surplus honey. This makes commercial beekeeping exceptionally difficult because of the necessity of maintaining so many and so widely scattered outyards. These have to be selected according to their relation to swamps or other conditions that develop the honey-bearing plants. Great care and judgment have to be exercised, too, in determining how many colonies of bees a particular range will accommodate with plentiful nectar. Also, there must be taken into consideration the variety of flowers in the range, whether there will be properly successive flowering of different plants as the season advances. Furthermore, the management of the bees differs very materially in many respects from that required or most approved in many other sections of the country. A succession of honey flows have their influence on the development of the colonies and the super requirements as the season advances. Indeed, it is these conditions that are often quite uncertain that make section honey most difficult and make the "chunk comb-honey" and extracted-honey production most popular in this part of the country.

There has been but little and scattered appearance of brood diseases in North Carolina. In several localities where American foul brood made its appearance the disease has been cleared out with no indication of reappearance. The bee-culture authorities of the state department of agriculture are on the alert and eager to give every assistance to beekeepers who are so unfortunate as to find disease in their yards.

There is a steady progress being made in getting bee owners, especially small farmers who have all along kept their bees in the old-fashioned gum and box hives, to put them into standard improved hives. This will greatly simplify control of disease troubles as they develop. Numbers of large apiaries of old gum and box hives have been transferred this spring, or at least this work has been started under conditions that assure complete standardization within a season or two.

An effective method in transferring the gum hives on the usual benches close together is to transfer, say, every fourth colony early; then when they are working well and those on either side are threatening to swarm, move them away to other benches and throw the old worker bees from them into the standard hives on either side. The following spring this is done over again for that line of gums. In this way the expense of modernizing the apiary is spread over a longer period, and the results in "honey gathering" are surprisingly large. Of course, the moving of the old gums and throwing of the worker bees from these into the improved hives must be done on a day when there is a heavy honey flow so that the bees will not "fight."

Wilmington, N. C. W. J. Martin.

In Texas.—The weather conditions which held the bees back during February and March continued through the first half of April. Then the cold ended, the rains slacked away and the honey flow commenced. In southwest Texas this date was the 21st. Inquiry among the older beekeepers indicate this is the normal date when a surplus commences to be stored. Huajilla, catsclaw, guayacan, verbena and horsemint all came into bloom at once. Hives on scales in various parts of this section showed an increase of from two to fifteen pounds per day on good days. Some extracting has taken place. The central and eastern parts of the state report conditions favorable but backward. The weather condition since the ending of our winter has caused the loss of many colonies of bees. As the weather up to the middle of April would not permit the bees to fly, no nectar came in even though there were plenty of nectar-producing plants in bloom. As a result, the colonies built up as long as the old stores lasted, and then starved. One beekeeper reported that he lost 19 out of 36 colonies in one yard in three days. He fed, and should have returned and fed again but high water prevented. If this loss is to be counted in the winter loss, it will make the winter loss very high.

The summer meeting of the Texas Beekeepers' Association will be held during Farmers' Short Course at the Texas A. & M. College, College Station, July 29 and 30, 1924. The program will be a very interesting one, and will be given to the public in a few days. In the past years the beekeepers from the various parts of the state have come to these meetings, boasting of their honey. This year each beekeeper is requested to bring a pint of his best honey, as Tuesday night there is to be a honey-biscuit feed. Come and bring your honey and Honey.

Pin clover, or filaree, is given as being a good honey plant in many parts of the West. Its near relative, *Erodium texanum*, Texas filaree, was a life-saver to many colonies of bees in Texas this month. As a rule, this plant is not numerous; but this wet cold spring seemed just fitted to it, and solid acres were covered with it. At times the bees stored enough nectar from it so that one could get the taste and color of the honey. The honey is strong but light in color. The pollen masses collected by the bees from this plant are very dark red.

Prof. Richmond of the Department of Entomology of A. & M. College, with a number of students from the classes in apiculture, made a tour of southwest Texas, April 16 to 20, studying the methods of the commercial beekeepers and the honey flora.

Many of the beemen who moved their bees to the cotton belt last year are now bringing them back to get the spring honey flow from the chaparral. Most of these men report this move was profitable, as it not only saved the bees and made a small crop of cotton honey, but gave them good, strong colonies for this spring. In some cases the cotton honey crop more than paid for the cost of moving both ways. H. B. Parks.

San Antonio, Tex.

* * *

In Michigan.—Following a normal winter favorable to the bees, southern Michigan has experienced a great deal of cloudy, cool weather. Thus far the season is at least two weeks late, and there have been a great many days since April 1, when the highest temperature was but little above 50 degrees during the middle of the day. As a result there has been an unusually heavy consumption of spring stores. In fact, much of the loss since last fall can be accounted for by either starvation or spring dwindling. Unless much stimulative feeding is done, many colonies will not be ready for the honey flow.

The winter was favorable to honey plants, and, although the cool spring weather has held back the clover somewhat, the flora is in better condition than are the bees.

Beekeepers' automobile tours of inspection are being scheduled for all of the counties in which beekeeping is prosperous. These tours are conducted by the Extension Specialist in beekeeping, Edwin Ewell, in co-operation with the local county agricultural agent and secretary of the county association. Beekeepers who seldom attend indoor meetings take in the tours and pick up many pointers from the various apiaries visited. The long line of automobiles, with banners of the local beekeepers' association attached, attracts enough attention to be of value as an advertisement.

A survey of beekeeping conditions in the Upper Peninsula of Michigan shows that there are 143 beekeepers owning 1132 colonies at present. This is but a fraction of the number that this disease-free, nectar-bountiful territory will support, and demonstration apiaries are being established by this office to show what improved methods will do.

The area clean-up campaign against foul brood is being carried into several new counties this spring by the Director of Apiary Inspection, B. F. Kindig. Already the Upper Peninsula and several counties in the Lower Peninsula have been freed from disease by this method

during the last two years. The inspectors see to it that every colony of bees in the county visited is inspected and treated if disease is present. A later inspection is then made to clean up the hangovers.

More colonies of bees are changing hands in Michigan this spring than usual, both large apiaries and small. On the other hand, judging from inquiries received, a large group of beginners will join the ranks. Russell A. Kelty.

East Lansing, Mich.

* * *

In New York—May 5, and we still have a steady fire in the furnace for it is cold and rainy. Excepting pruning and dormant spraying of fruit there has been absolutely no farm work done to date, and, if the weather turns for the better now, it will be a week before farmers can do any spring seeding.

Early fruits, such as cherries and peaches, are usually in bloom before this time but are still quite dormant, the season thus being at least two weeks backward. Fruit prospects are good, as far as a crop is concerned; but the storage houses here still have large quantities of apples in them, that are being sold at about the cost of storage. In some cases they are being drawn from the storage to the cider mill after having paid 75 cents per barrel storage charge. I just relate the above to show that the honey market is not the most depressed of all farm commodities, for, in the case of honey, it is mostly all cleaned up at reasonable prices in spite of the largest crop this section has harvested in many years.

In spite of the backward weather, where bees have been well protected and supplied with an abundance of honey and considerable pollen stored in their combs, they have wintered well and have progressed well with brood-rearing. In fact, it looks as though they may reach their peak before the beginning of the clover honey flow; but a checking effect on this has been a great scarcity of natural pollen. The elms and maples, which usually begin yielding the first of April, did not give any pollen until April 27.

The method of building up weak and moderately weak colonies, as given by Mr. Crane in May Gleanings, meets our hearty approval and is just the method used by us for many years. In fact, we believe we owe a good deal of our practices to some of Mr. Crane's writings of some years ago. But after the scattered infection of American foul brood we had last season we shall be extremely cautious in all swapping of combs or bees this season, and would warn others to do likewise.

The investigation of spray and dust poisoning of bees, undertaken last yeaf by Prof. R. B. Willson of Cornell University and Geo. H. Rae of the A. I. Root Company, will be continued this year, and it is hoped that enough data will be collected so that definite relief from this terrible annual slaughter of the fruit-growers' best friends may be averted. The gratitude of both beekeepers and fruit-growers will be extended to the College of Agriculture and to The A. I. Root Company for having undertaken the work. We expect to be in touch with these men while they are in western New York and will be glad to hear from any one having trouble by poisoning.

Clover is in fine condition, and we expect a good season for New York honey producers.

We cannot help having thrills for Louisiana while reading E. C. Davis' notes in May Gleanings.

Ransomville, N. Y. H. M. Myers.

* * *

In Oregon.—The beekeepers of Oregon have suffered a serious loss in the recent death of Prof. A. L. Lovett, who for many years has been Professor of Entomology at the Oregon Agricultural College. Up to 1920 Prof. Lovett had direct charge of all work in beekeeping in this institution. Although the work has been in charge of the writer since that date, Prof. Lovett has given it his best support. It has been largely through his effort that advancement has been possible.

E. J. Ladd, another friend of Oregon beekeepers, also passed away during the past month. For many years Mr. Ladd had been connected with the apiary department of the Portland Seed Company. Being a student of beekeeping himself, he has always backed up every effort leading to better beekeeping. He has been of direct personal help to hundreds of individual beekeepers. His influence for good will be felt for a long time to come.

Reports coming in from various sections of the state as well as personal observations indicate that bees have seriously run short on stores this spring. One reason for this shortage apparently is the small amount of maple bloom in most sections. The amount of brood is short of normal as a result. European foul brood is also bad in northwestern Oregon.

However, the clover is looking exceptionally good. The stand is far better than usual and the acreage is greater. Hungarian vetch is becoming a factor in the Willamette valley. The flow from this new honey plant started the first

week of May when only about six or eight inches high and long before it comes into bloom. The market outlook is improving.

Corvallis, Ore. H. A. Scullen.

[Some of the vetches are provided with glands which secrete a sweet liquid and which are located outside the flowers, appearing as spongy tissue. These are called extra-floral nectaries. This explains how these plants could furnish a honey flow before their blooming period. Other examples of this are found in cotton, castor beans, partridge pea, Hawaiian hau and other plants. The honey made from the sweet liquid from extra-floral nectaries is sometimes called plant honeydew, to distinguish it from floral honey and honeydew of insect origin.—Editor.]

* * *

In Arkansas.—This spring has given us no little worry. The cold extending into May has retarded materially brood-rearing. Farmers have had to replant corn and cotton. Many have had to import cotton seed at quite an expense since the recent cold killed cotton and caused a poor stand, this necessitating replanting.

Most of the beekeepers, with whom I have talked, tell me of late spring losses. I attribute this to starvation. As a rule, we secure quite a honey flow from black locust, but this year the bees did not get a drop from this source. The cause, I think, was the cold weather during the bloom.

Prospects, aside from these, are very promising. It looks as though we shall get a good crop from white clover, since the plants look better than they have for some time past at this time of the year. J. V. Ormond.

Elba, Ark.

* * *

In Ontario.—The season here in Ontario is very late. This is May 10, and this spring, all told so far, I doubt whether the bees have had three full days in which to carry nectar or pollen. While the weather has been steadily cool with much rain, and vegetation has been kept back correspondingly, yet if we should get nice weather soon, no doubt the bees will come along very fast. Although nothing to speak of has come in to date, yet we have found very few colonies short of stores and, generally speaking, our bees seem to be in good condition, with very small losses through the winter and spring. I doubt whether clover ever looked better, as it wintered well, and although the weather has been cool, with an abundance of moisture in the ground, clover has done well. Large fields greet the eye at many places, and most of it looks unusually even and green for this time of year. Today while the sun was shining for a while, the bees brought in dandelion pollen for the first time this spring. Early willows are open, and all we want now is sunshine to warm things up a bit.

From what I can learn, last year's crop of honey is pretty well cleaned out. Some small lots are still held in the hands of producers, but the amount in the aggregate is not large. Last week I was talking to a large dealer in Toronto and learned that he had practically no extracted on hand, although, strange to say, he had a large shipment of comb honey still unsold. Comb honey has been selling high in Ontario because little is produced here, comparatively speaking. Quite a lot has been imported from the United States during the past few years, and the advice has been given for Ontario beekeepers to produce more comb honey to look after the market now cared for by this imported article. This advice may be sound but it looks as though the peak prices of comb honey have been reached or (shall I say?) passed, so any one contemplating producing comb honey can not reasonably look for the high prices that have prevailed during the past few years. The dealer I have in mind was offering this comb honey to the trade at less than it had cost him, and he told me that he was going to move it if he had to sell lower than present quotations as he was afraid of granulation. The comb honey was a fine article and it rather jarred me to find that it was not moving better, for I had been led to believe that comb honey could be sold about as fast as offered.

By the time this in print, beekeepers in this latitude will be just about as busy as at any time in the year if weather permits. In a late season like the present, dandelions, willows, maple and fruit bloom are all crowded together, and clipping queens and other early work must be done with a rush. After this bloom is over, in most localities in Ontario we have a dearth of nectar for about two weeks or more, and during that time all work with the hives is almost impossible. After the clover flow starts, clipping and other spring work are not to be thought of, for other and more important work must be attended to then. In common with many others I expect to be very busy—in fact, we are very busy now, so this will explain why my notes for this issue are shorter than usual. J. L. Byer.

Markham, Ont.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Food Chamber Completely Filled. Recently I learned of a case where the bees had gone into the shallow super (food chamber) during the winter where there was very little honey, and had starved, while in the brood-chamber there were abundant stores. This was no surprise to me, because 90 per cent of our bees were in the shallow super when I first inspected them in April; but the shallow super was solid with early-gathered honey last fall and we wintered 100 per cent. To me this is an important point, and I bring it to your attention that you may emphasize that the super be filled, irrespective of what the brood-chamber may contain. Pray, do not think me impertinent. I am so surely convinced of your sound teaching that I am eager to see every advantage of the shallow super presented. If I could only drag the doubters here, I could convince them that it pays. When I think of the labor of spring feeding that I used to have, and the time lost, it makes me shudder.

West Allis, Wis. Joseph M. Barr.

Montana Produces 2,000,000 Pounds of Honey. During the year 1923 approximately two million pounds of honey were produced in this state. Of this amount thirty carloads were shipped out of the state by January 10, 1924. Although not all of the honey produced is sold, there seems to be no doubt that everything will be cleaned up before the new crop is ready for market. During the past month honey sales have been somewhat brisker than before that time.

Montana in general has experienced a mild winter, with only two spells of below-zero weather. It is the consensus of opinion that we have had more snow this winter than for a number of years. This means that there should be plenty of water for irrigation purposes so that Montana may once again experience big crops.

Reports from all over the state seem to indicate that bees have wintered in good condition. The past fall weather was exceptionally fine, and colonies were able to rear brood late. The fact that the weather during the latter part of January and all of February has been almost like spring started colonies to begin brood-rearing early in February. These facts make it obvious that there is a heavy consumption of honey. Colonies, however, which had been given a sufficient amount of honey will come through strong in bees and ready to do the work.

Bozeman, Mont. O. A. Sippel.

Do Bees Prefer Sweet Clover? Although I am somewhat of a novice in bee culture, I do not agree with E. G. Browning's article on page 173 in the March Gleanings. I live a short distance from Mr. Browning, and, like him, have great faith in our white sweet clover, as to quality, quantity and length of honey flow; but I do not believe that the bees prefer sweet clover to any other honey bloom. For the past two seasons my neighbor's alfalfa has started to produce nectar before the sweet clover and the bees have worked this first. This alfalfa is three-fourths of a mile from my apiary, the bees having to fly beside a solid field of blooming sweet clover the entire distance. By altering their course a little, they would be among the clover; but they stay with the alfalfa till the last of it is cut. Other years they start on the clover first, so I believe that it is merely a case of which bloom produces nectar first.

Eight Point, Mont. A. P. LaRocque.

Embargoes Affect Migratory Beekeeping. Much has been said in the last few years regarding the transportation of bees by team and wagon, motor truck and by rail from state to state and from county to county, and there are many good reasons for that. We often see by moving only a few miles that it is possible to save the bees, and sometimes make a crop of honey. After seventeen years of experience I am positive there are many beekeepers who would favor shipping if they could learn more about it. There are many who are making a success by moving their bees two or three times each year. With the good roads which we now have in many places, it is possible to move bees a long distance in a single night and place them where a crop can be secured. We hope that the lawmakers of our different states and counties will carefully consider the laws they make against the moving of bees. This does not apply to any one state or county; but it must be understood in a broad sense that the moving of bees is fast becoming one of the important developments of beekeeping. N. E. Miller.

Colton, Calif.

Bad "Break" by the Editor. I want to enter protest against the manner in which my notes, on page 307, May issue, were cut. The Editor struck out the notes regarding the short courses in southern Manitoba, but left in a few lines stating that most of the beekeepers in these localities have been purchasing imported honey, but since a few had secured hives of their own they had been able to get two hundred pounds per colony. This appeared as though I meant it for the whole province, while I was speaking of only that locality. However, I realize the difficulty the Editor is working under in order to work all these notes into the space afforded for that department, so I do not feel like judging him too harshly, but I am criticized very severely by eastern Canadian beekeepers for the reports I send out on honey crops in this territory, and it has only been a few issues since I reported that the average for this province last year was 156 pounds per hive. To send out a report now that a few are receiving 200 pounds per hive only helps them to prove me a liar. L. T. Floyd.

Winnipeg, Manitoba, Can.

Clipping Queen with Pocketknife. It is the practice of most beekeepers to clip a queen whenever they happen to see her while examining the colony, when they are not usually equipped with a pair of scissors. A method of placing the queen's wing on the corner of the hive and cutting it with a knife has been advocated and works very well, but it is easy for a nervous person to make a slip and crush the queen to death.

A safe way is to hold the queen between the first two fingers, with the thumb pressing upon the thorax, and place a knife blade under whichever wing is to be clipped, raising it upon the thumb nail and cutting it off.

Try it, if you never have and you'll find it works fine without any danger of crushing the queen. John C. Hogg.

Ludlowville, N. Y.

The Prevention of Increase. When hiving a swarm with a clipped queen, I put the new hive on the stand until the bees have come back and gone in, setting the old one to one side. If it is an unclipped one I put it in a new hive in the regulation way, leaving the old hive on the old stand and putting the swarm by the side of it with the entrance the opposite way. In two or three days I put the new hive on the opposite side of the old one, doing this in the middle of the day. All field bees coming back and not finding their hive will go into the old hive. I change the hive from one side to the other three or four times, at intervals of a day or two, then open the new hive and shake off all remaining bees in front of the old hive, first destroying one of the queens; or, if in a rush, I let them fight it out, unless I want the old one left, in which case I pinch the head of the young one.

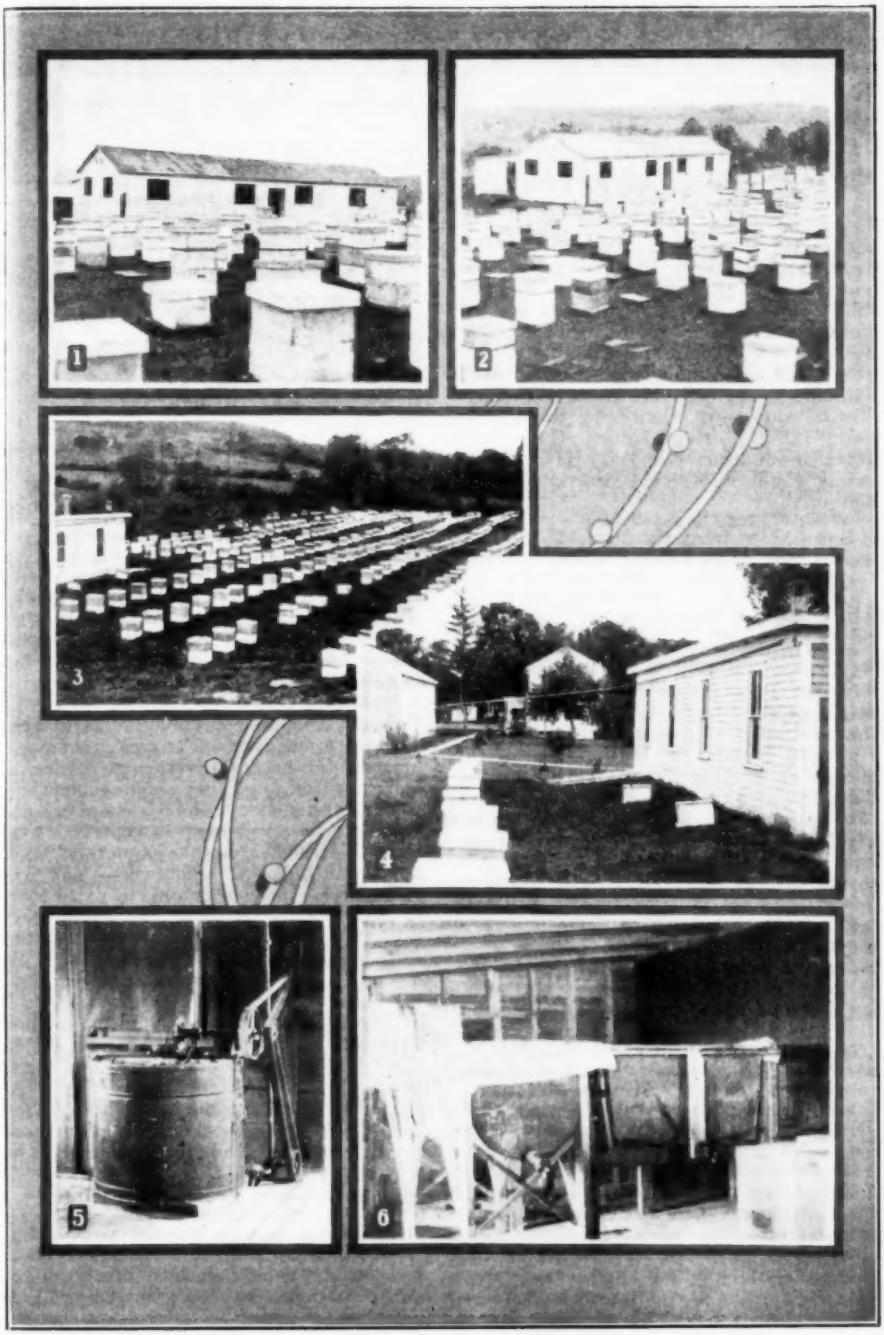
It is well enough to cut out all queen-cells, although, as a rule, the queen will attend to this at once. If the old queen is killed, be sure there is a young one in charge before removing all cells, or sometimes the swarm is cast several days before the new queen emerges. In this case I leave only one or two of the best cells. There is generally a frame or two of eggs in the new hive which can be utilized. If this is an early swarm it will be a rouser for now I have all the bees and all the brood, and, by putting in the eggs laid by the queen of the swarm, all the eggs as well. M. R. Thompson.

Malung, Minn.

[Under most conditions the parent colony would cast an after-swarm soon after the first young queen emerges (usually about seven days after the prime swarm issued) when this program is carried out unless all but one of the queen-cells are destroyed before a young queen can emerge. Even when all but one of the cells are destroyed, occasionally the surviving young queen will go out with a swarm, leaving the colony hopelessly queenless. This can be prevented by destroying all the queen-cells about five days after the swarm issued, then again five days later, then introducing a young laying queen or giving the old queen back when the colony is finally reunited. —Editor.]

Influence of Vigorous Queen Workers. The workers of a colony cannot be expected to store as much surplus if they have a failing queen as they might with a young, vigorous one. Unless the queen is prolific the activity of the bees seem to fall off sooner or later. The young, active queen seems to have an influence on the workers in and out the hive, stimulating them to do their utmost. The energy that seems to be possessed by the workers when a thrifty queen rules is very pronounced. A. C. Gilbert.

East Avon, N. Y.



BEEKEEPING IN NEW YORK STATE.

(1) and (2) Different views of home apiary and honey-house of R. V. Cox, Sloansville, N. Y. (3) Partial view of apiary of Like & Eldrege, Sharon Springs, N. Y. (4) Extracting house and packing house (Like & Eldrege). Honey is carried from extracting house at right to packing house at left by an overhead pipe. (5) Extracting room of Like & Eldrege. (6) A battery of honey tanks.

GLEANED BY ASKING

Geo. S. Demuth

When Queen is Lost in Swarming.

Question.—What is the best management of a colony that has lost its queen by swarming?

New York. Frank F. White.

Answer.—Destroy all of the capped queen-cells at the time the colony is found queenless; then wait until all of the brood is sealed, which will be nine days from the time the queen was lost, and destroy all queen-cells, being sure that none are missed. To make sure of this, it is necessary to shake most of the bees from the combs in order to see the post-constructed queen-cells. Since some of these queen-cells are built over large larvae, they are small and difficult to find. At this time (nine or ten days after the queen was lost) introduce a young laying queen by the usual cage method.

Killing Old Queens.

Question.—If I attempt to requeen by killing the old queen and allowing the bees to rear another, will the bees be likely to swarm when the first of the young queens emerges? Should this be done during or at the close of the honey flow? J. Ledlie.

South Africa.

Answer.—If this is done during the midst of a good honey flow, the colonies would be almost sure to swarm soon after the first of the young queens emerges. However, if done on the approach of the closing of the honey flow, there would be but little if any trouble from swarming, for the young queens would then emerge after the honey flow has closed. However, this method of requeening is open to the serious objection that it offers no opportunity for improvement of stock. It would be better to rear queen-cells from a good breeding queen to give to each colony in which the queens have been killed. As the honey flow is closing is a good time to do this.

Uniting Two or More Swarms.

Question.—Is it advisable to unite two or more swarms as they issue, to secure an extra-strong colony? Arthur H. Wakeman.

New York.

Answer.—It is sometimes an advantage to unite two or more swarms, in order to make extra-strong colonies during the honey flow. This is especially true if the main honey flow comes on just after the swarms have been united, as in a clover locality where the swarming season comes during the honey flow. This plan brings good results if the colonies are not as strong as they should be, so that the swarms are not large. However, if the honey flow does not come until a few weeks later, it would not be wise to unite swarms in this way. Neither is it advisable to do so when the colonies are abundantly strong to begin with, for it is sometimes difficult to induce a great mass of bees to work with proper vigor when crowded into one hive.

Using Old Queen-cells a Second Time.

Question.—If a queen-cell is left this year, will the bees use it next year?

New Hampshire. A. A. Woodward.

Answer.—Bees do not use old queen-cells left over from the previous year. Usually the old queen-cells are torn down completely, although sometimes the base is left. Even this is not used for a queen-cell next year, as a rule, but entirely new cells are built.

Reducing to One Story for Comb Honey.

Question.—I have my bees in two ten-frame hive bodies during the spring and want to produce chunk honey in shallow frames. What is best to do with the extra hive body at the beginning of the honey flow when the supers for chunk honey are put on? G. C. Parker.

Indiana.

Answer.—The best disposition of the second story depends upon circumstances. If the second story is fairly well filled with honey at the time of putting on the shallow supers a good way is to set off the second story, placing it on an extra bottom-board and putting on a cover; then set this new hive close beside the old one and give it a ripe queen-cell. Most of the bees will return to their former location, and this colony now becomes a nucleus. Enough bees should emerge from the brood so that this hive will be filled almost completely with honey during the honey flow and the young queen will have only a little room to lay. At the close of the honey flow, kill the old queen and unite the two colonies by the newspaper plan, thus requeening and supplying ample stores at the same time. If the second stories are not well filled at the beginning of the honey flow, they may be tiered up on some of the weaker colonies to have them filled during the honey flow. At the close of the season these hive bodies now filled with honey can be given back to the colonies, thus making each two stories high.

Newly Hived Swarms Swarm Out.

Question.—What should one do when newly hived swarms refuse to stay in the new hive?

New York. Miss H. E. Gould.

Answer.—Some seasons newly hived swarms swarm out soon after being hived worse than during other seasons. To prevent this, the new hives should have ample ventilation by opening the entrance to its largest size, and the hive should be shaded by placing a wide board or several boards cleated together on top of the

hive so that it projects about a foot over the south side. There should be a space between this shade-board and the cover of the hive for circulation of air. Placing an empty hive body (without frames) below the brood-chamber of the new hive at the time of hiving the swarm and leaving this in place for three or four days will usually prevent swarming out. Another preventive measure is to give at least one old brood-comb among the frames of foundation in the new hive. If extracted honey is being produced, a full set of old combs may be used in the new brood-chamber.

Swarm Returns to Its Hive.

Question.—I had a swarm come out and return to its hive twice. What caused them to do this? H. L. Chadwick.
Massachusetts.

Answer.—It sometimes happens that the queen is not able to fly even though she is not clipped. In such cases the swarm returns, and in a day or two the colony again attempts to swarm. If the queen was unable to fly because of being too heavy with eggs, she is usually prepared to go with the swarms on a second effort. In case the queen is unable to accompany the swarm after two or three attempts, the bees will then kill the old queen and wait until one of the young queens emerges about eight days after the first attempt to swarm, when a swarm will issue accompanied by one of the young queens unless the beekeeper interferes to prevent this.

Fences Right Side Up in Supers.

Question.—Should the fences be put into the super with the long projection of the end post up or down? Joe C. Ritchey.
Pennsylvania.

Answer.—The long projection should be down in the super. The end post is made to project further at the lower side on account of the space taken up by the bottom-bar of the section-holder. If placed with long projection up, the bees will build brace-combs across the wide space at the top.

Destroying Brood That Would Emerge Late.

Question.—Do you advise cutting out combs of brood that will emerge after the honey flow when there will be at least a month of dearth, or is it better to uncap the brood, thus saving the combs? M. C. Engle.
Cuba.

Answer.—Instead of destroying the brood after it has been fed almost to maturity, it would be much better to restrict brood-rearing at a time brood is not wanted. It should be remembered that it requires at least four pounds of honey to nourish the brood in a single comb, standard size. In many localities it is seldom if ever advisable to restrict brood-rearing or destroy brood, especially where there is a later honey flow; but in localities having an early honey flow, followed by a long dearth before the broodless period, much honey could be saved by restricting the queen to a smaller brood-nest, or by killing the queen at the proper time; then ten days later destroy all queen-cells and give a ripe queen-cell or virgin queen.

Deep Space Below Frames.

Question.—Does a deep space between the floor and the bottom-bars of the frame cause the bees to lose time during the storing season by having to climb up the sides of the hive? or will it be advantageous in diverting the storing bees from the brood-nest?
England. T. T. Taylor.

Answer.—Probably no time is lost by field bees entering the hive because of the deep space. Strong colonies having many bees too young to work in the field often have a cluster of bees reaching from the bottom-bars of the frames to the floor of the hive. It is not unusual to see returning field bees fly into a large entrance and alight directly on this cluster of bees. In many cases the bees build little ladders of wax and propolis from the floor of the hive, which enable them to climb directly to the combs above. There is no conclusive evidence that the deep space is advantageous in diverting the storing bees from the brood-nest. The chief advantage of this deep space is better ventilation, together with increased room for idle bees, thus relieving the congestion of the brood-nest.

Use of Queen and Drone Trap.

Question.—Should the queen and drone trap be left on the hive all the year around, or will it hinder the bees in their work too much?
South Africa. M. H. LeRoux.

Answer.—The queen and drone trap should be placed on the hive only temporarily when swarming is imminent. While the bees soon become accustomed to the trap and pass through the openings readily, it no doubt does hinder them in their work to some extent, and therefore should be taken off as soon as no longer needed.

Prevention of Increase.

Question.—In order to keep my apiary to a certain number, can I unite the swarms with the parent colonies or some other colony by the newspaper plan? Henry Neiling.
Michigan.

Answer.—Yes. If you are producing extracted honey you can hive the swarm in a new hive placed on the old stand; then put on top of the new brood-chamber a queen-excluder, and over this the supers that were on the hive when the swarm issued. Finally, place the old brood-chamber on top of the supers just as one would an extra super. The queen cells in the brood-chamber placed on top should be destroyed when this is done and again nine days later. If you are producing comb honey, you can manage in the same way except that the old

hive is set close beside the new one as soon as the bees of the swarm have marked their location; then at the close of the season the parent colony can be united with the swarm by the newspaper plan. By this latter plan, most of the bees in the parent colony should be added to the swarm a week after the swarm issued, to prevent an after-swarm.

Swarms Cluster Before Leaving.

Question.—Do swarms always cluster close by before leaving for a chosen location, or do they sometimes go direct from the hive?

Ohio. Francis H. Craig.

Answer.—As a rule, swarms first cluster near the apiary before leaving, but occasionally they go direct from the hive to the new home. This, however, happens so seldom that it is fairly safe to depend upon bees clustering before leaving.

Queen Lays Eggs in Queen-cell.

Question.—Does the queen deposit an egg in each queen-cell or do worker bees remove eggs from other cells and place them in queen-cells? Ella C. Miller.

Washington.

Answer.—So far as is known, the queen lays the eggs in the queen-cells under normal conditions. On the other hand, there is considerable evidence that under certain conditions eggs are transported from one part of the hive to another and placed in queen-cells. Some even believe that a colony that is hopelessly queenless may steal eggs from another colony and carry them home to put into queen-cells, although evidence that this has occurred is not convincing.

Queen-excluders for Comb-honey Production.

Question.—Would you advise putting a queen-excluder on in the spring in producing comb honey where drawn combs are used, to prevent the queen from spoiling the sections?

Mississippi. W. P. Kinard.

Answer.—It is not necessary to use a queen-excluder when producing comb honey on an established colony even though sections containing combs built the previous season are used in the first super, provided none of these sections contain drone comb. This is one of the advantages of using full sheets of foundation in the sections, for then the cells are of worker size so that the queen is not attracted to the sections by the presence of drone comb. The queen-excluder is not needed in comb-honey production except when a swarm is hived on full sheets of foundation or narrow starters and the super transferred from the parent colony to the swarm.

Indications of Swarming.

Question.—Does the presence of drone brood and queen-cell cups in the hive indicate swarming? Dorothy Lewis.

Ohio.

Answer.—At this season the presence of drone brood and queen-cell cups may be considered remote indications of swarming, but the colony is not definitely committed to swarming until eggs are laid in the queen-cells. Colonies that are properly managed may have drone brood and queen-cell cups (the base of queen-cells which are empty) but go through the season without swarming. When eggs or small larvae are found in the queen-cells the colony is then definitely preparing to swarm and will swarm about the time the first of the queen-cells is sealed unless something happens to prevent. In well-managed colonies the bees can sometimes be induced to give up swarming, even after eggs or small larvae are found in the queen-cells, by destroying these cells and giving more room, ventilation or shade if necessary. Sometimes after queen-cells have been started, especially toward the close of the season, a sudden stopping of nectar secretion may cause the bees to give up swarming.

Comb-honey Supers Placed Below Food Chamber.

Question.—By using the food chamber, then placing the comb-honey super under it, would not the bees start work in the sections quicker than without the food chamber?

New Hampshire. Elmer B. Stevens.

Answer.—Probably so, provided the food chamber is entirely filled with honey and brood. However, the food chamber should be removed before work in the sections has advanced very far because bits of dark wax from the food chamber would be transferred to the sections and the combs darkened in that way. As a rule, it is advisable to take off the food chamber when the comb-honey supers are given, and have each comb-honey super supplied with a row of bait combs (sections that were partly built last season having the honey extracted and the cells cut down to a depth of about ¼"). The food chambers are then tiered up on colonies not used for comb-honey production in order that the brood which they contain may emerge and the cells vacated by the emerging brood filled with white honey during the early honey flow. At the close of the season these food chambers are given back to the colonies.

Patching and Sterilizing Combs.

Question.—Will it pay to sterilize combs containing American foul brood that have considerable drone comb, then patch them after sterilizing? B. F. Trescott.

New York.

Answer.—This will depend upon the value of your time as well as upon the character of the combs you propose to sterilize and patch. Certainly any diseased comb that contains many drone-cells should go to the melting-pot especially since non-sagging foundation can now be had.

TALKS TO BEGINNERS

Geo. S. Demuth

The month of June is usually an eventful one in beekeeping throughout the greater portion of the United States and Canada. In most localities, especially in the North, the month ushers in both the main honey flow and the swarming season. While the season is late throughout most of the United States and Canada, nature has a way of making up for lost time so that the flowers which produce the surplus honey may not be much delayed in blooming after all. After a late spring the season usually comes on with a rush, both the colonies of bees and the flowers developing very rapidly. This will probably make this June a more eventful month in beekeeping than usual.

I sincerely hope that every beginner who reads these Talks has followed to the letter the advice given last month in regard to the food supply of the colonies during the building-up period. Thousands upon thousands of colonies in this country are annually put out of commission, so far as gathering a crop of honey is concerned, on the very eve of the harvest through the beekeeper's neglect in supplying sufficient stores to keep up extensive brood-rearing just previously to the honey flow. Often in the North, this danger extends well into June. It often happens that colonies, which have already reached their peak of brood-rearing, run out of stores during a rainy spell and carry out a large portion of their brood, completely ruining the colony. This sometimes occurs just before there is a flood of nectar in the flowers that would have enabled the colony to store a large amount of surplus, if it had been given a few pounds of sugar syrup or honey at the right time.

I also hope that every reader of this department followed the advice given last month in regard to an abundance of room for spring brood-rearing, having given a second story to all strong colonies, thus preventing the "proverbial swarm of bees in May," which, especially in the North, is an indication of improper management. If the bees can be brought up to the beginning of the honey flow without swarming and without being compelled to reduce brood-rearing on account of a lack of stores, the colony should be in fine condition for the honey flow.

While previous to the main honey flow the most important thing has been that of extensive brood-rearing, at the beginning of the honey flow brood-rearing is of secondary importance. Indeed, in localities where the honey flow is short it would be better if brood-rearing were sharply curtailed at this time, for the resulting workers would come upon the stage of action too late to take part in gathering this season's harvest. It requires three weeks from the time the eggs are laid until the young bees emerge, and about two more weeks before these young bees become field workers, although they are useful during the first two weeks of their lives as workers in the hive.

Strong colonies of young and vigorous bees at the beginning of the honey flow, the goal toward which the beekeeper has worked since late summer, do not necessarily insure that a good crop of honey will be produced. The flowers may fail to yield much nectar, which of course would result in a short crop even with strong colonies, through no fault of the beekeeper. However, there are two ways in which strong colonies may fail to store surplus honey even when the stores yield well. They may either swarm at the beginning of or in the midst of the honey flow and thus divide the great working force just at a time when strength of colony is most needed, or they may fail to do much work in the supers because the supers were not given at the right time or in the right position, resulting in a crowded condition and stagnation of the colony's activities. A division of the working force can be prevented by the plan described last month, and a stagnation of colony activity can be prevented by giving additional supers in advance as described below.

How Bees Prepare for Swarming.

The beginner who takes sufficient interest in his bees to examine the brood-combs frequently can witness the entire process of preparation for swarming. While it is not necessary to do this, it is well for beginners to do so since the whole phenomenon will then be better understood.

In preparation for swarming the bees build several queen-cells. These are usually built along the lower edge of the brood-combs or in some irregular portion of the combs. These cells may be built singly or in clusters of several cells. At first they appear as little cups of wax, opening downward instead of outward as do the ordinary cells in the combs. When finished they resemble a peanut shell, usually being pitted on the surface. About eight days after the egg is laid in the queen-cell, the cell is sealed. It is at this time that the swarm may be ex-

pected to issue if the weather is favorable. The first swarm in normal swarming is accompanied by the old queen. About eight days later the young queens begin to emerge, and, if no steps are taken to prevent, several after-swarms will issue, each accompanied by one or more of the young queens. These after-swarms come out every day or two until the colony has been so depleted that it can not send out more. Finally, all but one of the remaining young queens are killed, and further swarming is given

Fig. 1.—While swarm is out, old hive is set to one side, new one put in its place and supers transferred from old hive to new.

up. If the bees are permitted to carry out this program, they can not be expected to store surplus honey except in locations where swarming comes early in the season and the honey crop is gathered late, thus giving the various divisions of the original colony time to build up before the honey flow.

More About Hiving Swarms.

Beginners should not permit swarms to issue without first having clipped the wings of the queen or having placed a queen-and-drone trap over the entrance just before a swarm is expected. This will prevent the necessity of climbing trees to take down swarms, and also in some cases prevents the loss of swarms that would leave. It is a simple matter to hive swarms when the queen is caught in a cage, as described last month, or is caught in a queen-and-drone trap as the swarm issues. When a clipped queen is found on the ground in front of the hive she is easily caught in a cage by setting the cage over her and permitting her to crawl up into it. The stopper should then be put in the cage, which should be placed in a shady place, while the supers are taken off of the hive, the hive moved to one side (Fig. 1), the new hive put in its place and finally the supers put back on the new hive. The cage containing the queen is then thrust into the entrance of the new hive, or if a queen trap is used it is adjusted to the entrance of the new hive and the slide pulled out so that the queen can go down into the lower part and thus enter the new hive. The trap should not be taken from the old hive until sure that the queen is safely caught in the upper chamber of the trap.

What to Use in the New Hive.

If comb honey is being produced, the new hive should be filled with frames of foundation and one empty comb if at hand. It is not best to hive swarms on empty combs in comb-honey production since this would result in the bees neglecting the work in the supers that were transferred from the parent colony until these combs are filled. By giving frames of foundation, work in the supers is not interrupted to any great extent by swarming. The purpose of the one comb among the frames of foundation is to reduce the tendency of the bees to swarm out after being hived and also to furnish a receptacle for incoming pollen so that this will not be stored in the sections. If only full sheets of foundation are given in the new hive, it is well to place an empty hive body below the new brood-chamber to prevent swarming out, especially if the weather is hot. This empty chamber should be taken away two or three days later. A queen-excluder should also be placed between the new brood-chamber and the super when only foundation is given.

This work of changing the hives should be done quickly, for sometimes the bees discover that the queen is not with them before they cluster and may return to the hive within a few minutes after leaving. Sometimes, however, they will

Fig. 2.—After swarm has returned and entered new hive, old hive is turned toward new one.

cluster and remain clustered for some time before returning. Care should be taken to prevent the returning bees from entering other hives. If necessary, the parent hive may be covered with a piece of canvas until the swarm has returned.

After the swarm has entered and quieted down, the parent hive should be turn-

ed back toward its former position as shown in Figure 2, then a day or two later it should be placed close beside the new hive as in Figure 3. On the seventh day after the prime swarm issued, choosing a time when the bees are working well, preferably early in the afternoon, the parent hive should be picked up carefully and moved to a new location not less than 15 or 20 feet away, well away from any other hive. In doing this the hive should be handled so carefully that the bees are not disturbed so that in going to the field they will not note the change in the location of the hive. When this is done, most of the young bees,

Fig. 3.—A day or two later the old hive is moved close beside the new ready to be removed to new location on the seventh day.

which have become field workers during the week, will return to the new hive on the old stand instead of to their own hive, thus depleting the parent colony just before the first after-swarm would have issued so that there are too few bees to divide up and after-swarming is prevented.

For extracted-honey production, when increase is not desired the parent colony can be placed above the supers now on the new hive, after first destroying all queen-cells in it. The parent colony and the swarm are thus reunited, and as the brood emerges in the old brood-chamber the vacant cells may be filled with honey. When used for making increase the parent colony does not usually produce any surplus honey the same season after having been so depleted of its bees, but it should be in excellent condition for winter.

Management of the Supers.

When the second story was given as advised last month, if extracted honey is to be produced, the queen should be put down into the lower story three or four weeks after the second story was given. Usually the queen goes into the second story soon after it is given, if she needs more room, and is inclined to neglect the lower story so that after she has been above three or four weeks, there is but little brood left in the lower story. Before all of this brood has emerged and before the combs can be clogged with pollen the queen should be put down into the lower story, and confined there by means of a queen-excluder. At about this time another hive body containing empty combs, if these are at hand, should be given. If the colony is strong this super of empty combs can be placed between the two chambers now containing brood, being placed immediately above the queen-excluder on the lower story. This is usually done at about the beginning of the main honey flow.

Close watch should now be kept of the combs in the super to see if the bees are filling them with honey. Sometimes a set of combs is filled with green honey within a few days after being put on so that the bees need more room, while at other times the combs may be filled so slowly that those in the middle will be filled and sealed while the outside combs remain empty. In the former case, as soon as the bees are found putting the honey in the outside combs the third hive body should be added beneath the partly filled one if honey is being stored rapidly. This should also contain empty combs if these are at hand. If not, frames of foundation can be used, but it is sometimes well to distribute these through the two supers. A good way to do this is to take out half of the combs from the middle of the super in which the bees are working, placing them in the middle of the new super, filling the space where the combs were taken out with frames of foundation, then placing the new super on top. This bridges the work of the bees through two supers. This procedure should be followed until toward the close of the honey flow, giving the new super in each case as soon as the bees begin storing in the outside combs.

In case the combs are filled so slowly that those in the middle are filled and sealed while the outer combs are still empty, the middle combs can be taken out, the honey extracted, and the combs returned to the bees to be refilled. In this case it is not necessary to give additional supers. In a very slow honey flow it is often advisable, when returning the empty combs, to move the partly filled ones to the middle of the super and place the empty combs on each side.

If a colony has two stories at the beginning of the main honey flow and comb honey is to be produced, it will be necessary to take off one story and place

(Continued on page 396.)

(Continued from page 363.)

had not had access to such water. He then went on to explain that "chilled brood" was responsible in his case. Considerable brood had become chilled and died, and that this dead brood turned into foul brood.

At this point I entered into the discussion and went into the cause of disease in general, and foul brood in particular. I explained how foul brood among bees, like certain diseases among people, was caused by a specific germ in each instance. I went into the facts concerning yellow fever and gave the history of the events that led to the eradication of that disease at Havana. Likewise I discussed smallpox, bubonic plague, mumps, measles and some other diseases.

Then I took up the subject of germ life and explained that it did not differ, except in detail, from that of plants and animals. I told them of the experiments of the scientists Pasteur, Lister and others, and how the theory that certain conditions alone could bring into existence germ life was without any basis of fact; that every effort by scientific men to produce spontaneous generation of germ life had failed; that just as we have to have the seed of corn, oats, potatoes and tobacco before these plants can be grown, so it is with the brood diseases; that the stagnant water could no more have brought into existence the germ of foul brood than it could have produced a herd of Durham cattle or a flock of Leghorn chickens; likewise that brood that had become chilled and died, could no more produce either of the brood diseases than could a man contract yellow fever or bubonic plague by having his fingers frost-bitten.

Did I convince those men as to the facts concerning foul brood? Well, about a month later the man who held the stagnant-water theory pointed out to me the place where the stagnant water had been that gave the bees foul brood. A short time after the conversation related, the other man brought into town six or eight two-story hives of bees that had American foul brood. I found him building a bonfire, and he explained that he was going to burn the bees, hives and all. I advised him against destroying the hives and bees, and offered to help him treat the colonies, explaining that I had treated successfully several hundred colonies during the preceding 10 years. I also called attention to the fact that it was about four miles to the nearest apiary and that there was no possible danger of any robber bees from his or any other apiaries. His reply, as I recall it, was as follows:

"I am the foul brood inspector for this district, and the law is that these bees shall be burned."

I asked to see a copy of the law, but he said he had none. I then asked him where he got his information that such was the law of California, and his reply was that he had been told such was the law by the foul brood inspector who had appointed him deputy inspector for that district.

In reply to this I told him that I doubted whether he understood the law correctly; but that if he were right, I welcomed an opportunity to test such legislation, and also to prove to him that it was not necessary to burn the bees. However, he burned the bees that evening.

Brood Diseases and the Careless Beekeeper.

Another class of beekeepers, of which I have met a number, is those who take bee journals and are familiar with the methods of treating the brood diseases, but they just can't treat foul brood successfully because they are careless. Particularly do I recall two instances in Cuba. One was a man who went to Cuba with considerable reputation as a practical beekeeper. He knew all about the theory of foul brood treatment, but when confronted with the disease he failed. The cause of his failure was that about the time he had shaken the bees of the colonies he was treating, he would decide he had done enough for one day, and would allow the combs of foul brood honey to be robbed out. The result in the end was that not he, but foul brood, became master of the situation. The other instance had to do with a beekeeper who was born in Cuba, the son of one of the first practical honey producers of the Island. At the time I knew him he was about 40 years of age, and all his life had done little else but work bees. It was quite generally conceded 25 years ago that he was one of the best-informed men in Cuban beekeeping. He also knew the theory of foul brood treatment, but he would not put it into practice. In one instance, he shook a number of diseased colonies, and when asked if he was not going to cook up or burn the diseased combs, replied: "Why should I? All the colonies in this yard here have foul brood." The preventing of the colonies that had just been treated from again contracting foul brood was a matter that neither of these men could be depended upon to do. Foul brood caused both to abandon beekeeping—at least neither was keeping bees the last I knew.

Fighting Disease Beneficial to Careful Beekeeper.

There is another type of beekeeper, however, of which it is more pleasure to write. He is the man who conquers the

brood diseases and is a better beekeeper by reason of the experience. I met some of this class in New York State where European foul brood had raged. From my observation, European foul brood in New York State either put the beekeeper out of business or made a real beekeeper out of him. It was during the summer of 1908 that I was there. The situation, as it then existed, has been told a number of times in the bee journals, and by men who had been over more of the state than I. Most of the readers of Gleanings are familiar with what has taken place there; so I will tell of only one side of the situation, and that is the interesting study in human nature that presented itself to me there.

The Alexander method of treating the disease was, at the time I was there, an old story, and I do not recall any of the beekeepers I met who had the disease among his bees or who was in the line of march of the disease who did not know of that method of treatment. But in one whole day's travel by automobile, stopping and making inquiries whenever and wherever I saw beehives in the buckwheat region of New York State, where bees had been plentiful, the men who had mastered or would master the situation were in the minority. I remember one farmer, with a yard of about 200 colonies, who seemed to be bewildered. In talking with him I found he knew about the Alexander method of treatment, but all he was doing was to look his yard over every few days, mark the new colonies that had the disease and stack up the hives of those that had died.

As to those who were better beekeepers for having had to cope with the disease, well do I remember one in particular. He had about 150 colonies, all in one yard, and I can not recall having ever seen a yard in better condition. From his own story, he had been rather an indifferent beekeeper before European foul brood had struck his bees two years prior to our visit. "But," he said, "I decided that I had to do things right, or lose my bees." That he had done things right was very evident. I never saw an apiary of more uniform Italians or bees in better condition, all things considered. Best of all, he was getting more honey and the honey in better condition than he had before thought possible. This man had profited by adversity. His apiary of black bees had become pure Italians, his bee pasturage had been improved by the killing off of the bees of his neighbors who would not follow his example. Best of all, he had acquired a keener interest in bees and honey production and was making more money, besides deriving a whole lot of pleasure from his work.

Spread of the Brood Diseases.

Hawaii has, as I have said, no American foul brood, and has no idea of ever letting the disease get a foothold. To that end, among other things, legislation has been enacted governing the manner in which queen bees may be brought into the territory. To my mind, the honey producers of the territory are taking chances in allowing honey to be shipped in from California; for, strange as it may seem, practically all the honey on sale in the stores throughout the islands is shipped in.

The Island of Cuba has not been so fortunate in the matter of American foul brood. Cuba has the disease from one end of the Island to the other; or, at least it did when I was there.

So far as I am aware, I wrote the first article ever published to the effect that it was very possible that foul brood could be carried, in fact had been carried, in queen cages. I first got the idea from an American who had been interested in honey in Cuba for many years prior to the Spanish-American war. His story was that there was no foul brood in Cuba until after the importation of queens from the United States. The queens in question had been bought from queen-breeders who, it was found out later, had foul brood in their apiaries at the time the queens were shipped. This was some 40 years or so ago, and at a time when but little was known about the true nature of human diseases, let alone bee diseases; so in the matter of conveying foul brood to Cuba the queen-breeders should not be censured.

Sterilizing the Combs.

As to the method recently developed whereby the disease germ is killed, and the comb saved, I know nothing about this, other than what I have read in the bee journals, but I can at least give my opinion. I doubt that in the Tropics it would be worth while to save the combs. In the North, where the season is short, and a honey flow often a matter of days, combs count for considerably more; but even so there is still a doubt in my mind as to the value of treating the combs, that will have to be overcome by evidence.

From my experience with foul brood, I like to make a clean job of it. When possible I believe in shaking all the bees in an apiary and then moving them to a new location two or three miles distant, leaving the brood stacked up three or four stories high on the old location. When this brood has emerged and these colonies have laying queens, shake again, and cook up every fragment of comb before the sun appears the next morning. I know that works.

Willits, Calif.

A. I. Root's Story of His Own Life

Wait on the Lord; be of good courage, and He shall strengthen thine heart; wait, I say, on the Lord.—Psalm 27:14.

(No. 12.)

To make it a little more of an object for some beekeeper in every neighborhood to canvass his locality for subscribers, I agreed to make the price of Gleanings 60c for a club of ten names. This offer was not more liberal than many publishers made, and in many ways it seemed about right. Well, in those days of sharp competition in furnishing staple articles, there was much cutting under and agents were offering many periodicals at 75 per cent of the publisher's prices, or even less. They did not go around to the houses as publishers originally intended they should but transacted their business through the mails. In other words, they simply got the publisher's customers away from him by announcing that they would sell cheaper.

Gleanings would have been advertised for 75c in its own columns, had I not refused the advertisement. Why did I not sell it for 75c myself? Why, if I charged one man but 75c, I would have had to do the same with all.

I did not like to ask people to work for me without paying them, and for such work I wanted to be able to pay liberally. Still I was obliged to have but one price and to adhere to my printed rule, or else I should have been called dishonest. Several times I received 75c with the request to send Gleanings one year, at the same price that others were receiving, or else return the money. Of course, I had no choice but to return the money.

I finally concluded that only 25 per cent off the publisher's price to agents would be about right. This left little margin for presents and premiums, but I felt it better to have the paper published and sold for what it was worth of itself.

The Value of Premiums.

In the December number of Gleanings for 1877 I announced that I could not very well send a steam engine for hive-making as a premium for renewing a subscription before January 1, for one reason because I could not get it into the postoffice; and, besides, I was afraid some one might take the journal for the sake of the engine, and not for its own intrinsic value. Seriously, this is the way I felt about it. I wanted my readers to subscribe for Gleanings because they wanted it.

However, in spite of my former attitude toward premiums, when the Waterbury watch factory started, the manufacturers were anxious to get their watches into the hands of the people exactly as I was anxious to get Gleanings into the the hands of the people. They found out how Gleanings had made its way even into foreign lands, and into the hands of good, kind people, and they decided that instead of spending great sums of money in newspaper advertising they would rather give the watch at a very low price to some one who would and could make known its good qualities as I did. This enabled me to pay handsomely the friends who worked among their neighbors for the upbuilding of the journal; therefore I gave a watch to everyone who sent me five new subscribers at $1.00 each. A great boom in the subscription list came from that offer of a watch for five subscribers. In December, 1881, I sent out a gross of watches in only five days.

In the December issue of Gleanings for 1875, I announced that while Gleanings for 1876 would be $1.00 per year, including the new department, "Our Homes," Gleanings alone without "Our Homes" would be sold at the old price of 75c.

I announced that those who wished their paper continued without interruption would please remit for the next year shortly after the December number was out. As I did not wish to intrude it on anyone not wanting it, I took it for granted that all who did not remit before January 1 wished it discontinued, therefore no one needed to take the trouble to write me if they wished their subscription stopped. This applied also to "Our Homes." After two installments any reader could tell whether they desired it for the next year. If so, the extra 25c was to be remitted before January 1.

In 1875 I gave 16 pages of reading matter per issue for 75c, and the next year 24 pages without counting the four pages of "Our Homes," for $1.00. Furthermore, I decided that all who paid only 75c at the beginning of the year could send the extra 25c or not as they

chose. The main point was that no charge was made to any one for the Home department, and the 25c extra, therefore, had no reference to it. I wanted these four pages to be a free gift.

I considered it a duty to prune all matter sent me for publication and I always took this liberty when necessary, unless forbidden, and in case of copy where pruning was forbidden, I reserved the right to throw it into the waste basket if I thought it needed pruning. If articles were to be returned back if not accepted, I wanted that fact mentioned and stamp enclosed.

I never wanted Gleanings to be the vehicle for unprofitable controversy, and as I might err in trying to guard against this I announced that I would freely return the money to any dissatisfied subscriber for all unexpired subscription.

Gleanings Ruled Out of the Mails.

In 1879 the editor of our county paper was also postmaster. He remarked that my journal was but an advertising sheet, and it ought not to be allowed to go through the mails at journal rates. I thought this pretty hard but allowed the subject to pass by.

A few days afterward he came to me with an official paper bearing the stamp "Washington" and signed by the Postmaster General, declaring that the publication known as Gleanings in Bee Culture had been declared unmailable at pound rates under the section including periodicals whose primary purpose was to advertise the editor's business. I remonstrated and asked who it was that decided such matters. He showed me a law wherein this duty was assigned to the postmaster where the magazine was mailed and he stated that he had pronounced it an advertising sheet, but to be sure, had mailed a copy to Washington and they had also so decided.

I made inquiries of those who should know in regard to getting such a decision revoked, but it seemed pretty certain that a decision made by the Postmaster General, whether right or wrong, was seldom if ever recalled. I asked our postmaster what feature of my journal I should remove in order that it might pass through the mails. If I recall aright, his reply seemed to indicate that it was all objectionable.

In thinking the matter over it occurred to me that God had sent this trial to caution me in regard to selfishness and that Gleanings might be remodeled into shape where it would do more good. I wrote briefly to the Postmaster General asking what features of our journal must be omitted to allow it to pass through the mail, sending copies of our letterheads, envelopes, etc., consenting to omitting all mention of the manufacturing business as well as every advertisement of anything I had for sale in its columns if this were demanded, and I closed with something like this:

"I do not know to whom I am writing, whether it be to one who believes in the Bible and Jesus Christ, or not; but if I know myself, the primary purpose of Gleanings is to serve the Lord Jesus Christ and to benefit my fellowmen and especially to this end are the last two leaves devoted. In behalf of the hands I employ and the many whom Gleanings helps, I beg that your decision may be reversed."

The decision excluding Gleanings came just after the April number, 1879, was mailed. Before the May number was out, one of the clerks called from the top of the stairway saying, "Good news," and sent a paper floating down which fell at my feet. I raised it and read that the decision of April 1, 1879, excluding the publication named Gleanings in Bee Culture, from going into the mails at pound rates was revoked. Furthermore, the news also came that instead of paying three cents a pound, as I had heretofore, Gleanings could go at 2c a pound, and sample copies for which I had before paid eight cents a pound, could also go for two cents a pound. The greatest motive I had in sending out the sample copies was to get the last two pages containing the Home Papers scattered around where they might do good.

In the middle of April, 1882, I got out a supplement to Gleanings, which I called the Juvenile Gleanings, or Boys' and Girls' Bee Journal, the first number of Gleanings ever printed in the middle of the month. Later on, I decided to make the Juvenile Gleanings double its former size so that it would be as large as the regular Gleanings. Since many of the little folks read Our Homes I thought it might be just as well to have Our Homes in the Juvenile number, thus the old Gleanings could be all bees. No one could make any objection if I threw in the Juvenile without any additional charge; also no one could dispute my privilege of making it just as I wished, partly for old and partly for young folks. Finally, the juvenile feature was dropped, the mid-month number being the same as the number issued the first of the month.

On May 27, 1876, Gleanings had 1615 subscribers. On July 28, 1876, I had 1697, 89 new names during that month. On March 31, 1877, I had practically the same number; but by July I had over 2000. The last of August I had 2333; in November, 2513; and on September 28, 1878, I received my 4000th subscriber.

Classified Advertisements

Notices will be inserted in these classified columns for 7c per word. You must say you want your advertisement in the classified columns or we will not be responsible for errors. For special conditions on bee and queen advertising please write us. Copy should be received by 15th of preceding month to insure insertion. Cash with copy, if credit has not been established previously.

REGULAR ADVERTISERS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

W. E. Streetman, N. L. Stapleton, Robt. B. Spicer, A. O. Smith, F. M. Russell, L. Parker, A. I. Root Co. of Iowa, L. C. Mayeux, E. F. Jones, W. S. Johnson, Geo. A. Hummer & Sons, Howe Food Products Co., Gulf Coast Apiaries, Gilson Mfg. Co., Cottonport Honey Girl Apiaries, Madison Cooper, Chester N. Ballard, W. F. Barnes Co., Ault Bee Co., C. J. Appeldoorn, Irvin R. VanDevier, I. J. Stringham, Bush-Caldwell Co., American Poultry Journal, General Laboratories.

HONEY AND WAX FOR SALE.

FOR SALE—Clover honey in 60-lb. cans. J. F. Moore, Tiffin, Ohio.

WHITE clover honey in new 60-lb. cans at 11c. Hoehn & Honigford, Ottoville, Ohio.

CHOICE light amber extracted honey, two 60-lb. tins, $13.00. J. G. Burtis, Marietta, N. Y.

FOR SALE—Fine clover honey in new 60-lb. cans. Price on request. Dr. C. G. Luft, Fremont, Ohio.

FOR SALE—Comb and extracted white clover honey. Prices on request. Dr. E. Kohn & Son, Grover Hill, Ohio.

HONEY FOR SALE—In 60-lb. tins; white clover, 13c; for immediate shipment from New York. Hoffman & Hauck, Woodhaven, N. Y.

FOR SALE—Clover, amber and buckwheat honey in 5-lb. pails and 60-lb. cans. C. J. Baldridge, Homestead Farm, Kendaia, N. Y.

FOR SALE—White clover honey in 14-oz. glass jars, 24 to the case, $5.00 per case, f. o. b. Geneseo. G. A. Bailey, Geneseo, N. Y.

FOR SALE—Buckwheat in 60-lb. cans, 8c. Amber, 8½c. Fine quality white clover, 11c per pound. Roscoe F. Wixson, Dundee, N. Y.

FOR SALE—Choice clover extracted honey in new 60-lb. cans and cases. Also a few cans of amber honey. Write for price stating quantity desired. J. D. Beals, Oto, Iowa.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gallon barrels. Samples and prices on request. A. I. Root Co., 16-18 Jay St., New York City.

FOR SALE—Extra-choice white clover honey, case or carload. Sample, 15c. Also about 60 cases choice light amber. David Running, Filion, Mich.

FOR SALE—Comb and extracted white clover honey, extracted in 60-lb. cans, and 5 and 10 lb. pails. Prices given on request. Sample, 15c. F. W. Summerfield, Waterville, Ohio.

NEW crop extracted finest thick Florida white tupelo. Several tons in new barrels, thoroughly ripened on hives. Guaranteed not to granulate or ferment. M. L. Nisbet & Bro., Bainbridge, Ga.

HONEY AND WAX WANTED.

WANTED—Chunk honey in 5-lb. pails. J. E. Harris, Morristown, Tenn.

WANTED—Light comb honey; quote best price. 60-lb. cans for sale, 50c per case. M. V. Facey Honey Co., Preston, Minn.

WANTED—A car or less quantity of clover honey in 60-lb. cans. Mail sample and quote lowest cash price for same. A. W. Smith, Birmingham, Mich.

OLD COMBS, cappings or slumgum wanted for rendering by steam press process. We pay cash for wax rendered, trade for supplies or work it into foundation. W. T. Falconer Mfg. Co., Falconer, N. Y.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade price, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, Ohio.

OLD COMBS WANTED—Our steam wax presses will get every ounce of beeswax out of old combs, cappings or slumgum. Send for our terms and our 1924 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Ill.

FOR SALE.

HONEY LABELS—New design. Catalog free. Eastern Label Co., Clintonville, Conn.

BEES AND HONEY—Editor, George W. York, Spokane, Wash. Sample free.

CLEAN used hives. Queen-mating hives. Inexpensive. Crichton, 47 Alma Ave., Waverley, Mass.

EXTRACTOR, good condition, $22.00; hives, etc. No disease. S. Collyer, Black Mountain, N. C.

ROOT bee supplies and AIRCO foundation for 1924. A. V. Small, successor to C. F. Buck, Augusta, Kans.

SEND TODAY for samples of latest honey labels. Liberty Pub. Co., Sta. D., Box 4003, Cleveland, Ohio.

CONNECTICUT and Rhode Island headquarters for Root's beekeepers' supplies. A. W. Yates, Hartford, Conn.

FOR SALE—40 used 8-frame hives in good condition. Also medium brood foundation cheap. C. S. Watts, Monticello, Ill.

FOR SALE—65 3-frame nuclei shipping cases in good condition, at your price. Name it. D. C. Gilham, Schuylkill Haven, Pa.

FOR SALE—Extractor, Root two-frame, reversible. O. Postpichal, 868 N. 25th St., Philadelphia, Penn.

FOR SALE—Excelsior hand-printing press. Very cheap for cash. Complete outfit. J. D. Beals, Oto, Iowa.

FOR SALE—Good second-hand 60-lb. cans, two cans to case boxed, at 60c per case, f. o. b. Cincinnati. Terms cash. C. H. W. Weber & Co., Cincinnati, Ohio.

ADAPTABLE BEEHIVES, single or double walled, are sound in principle and are practical. For free information address Geo. P. Wood, Peekskill, N. Y.

FOR SALE—9-acre home located in clover belt, 10-frame L. dovetailed hives to handle 200 swarms of bees. 1800 virgin extracting L. combs. At a sacrifice, $2300. Write for particulars, or better, come and look it over. Phone No. 54F4. C. D. Townsend, R. F. D. No. 2, St. Johns, Mich.

ATTRACTIVE LOW PRICES—Write us for list of odds and ends, shipping cases, hives, etc., first grade, priced to save you money. Dadant & Sons, Hamilton, Ill.

FOR SALE—Drawn combs in 10-frame Standard Root bodies suitable for either brood or super work. Absolutely no disease. Porter C. Ward, Elkton, Ky.

ROBINSON'S comb foundation will please the bees and the price will please the beekeeper. Wax worked at lowest rates. E. S. Robinson, Mayville, Chau. Co., N. Y.

FOR SALE—50 Root metal covers with inner covers, in flat, $1.20 each; 50 cypress hive bodies, new, nailed, never used, ten-frame, 70c each. Ray C. Wilcox, Odessa, N. Y.

EIGHT and ten 2-story dovetailed painted hives, complete, used one season. 10-frame, $1.50; 8-frame, $3.00. Hoffman brood-frames, 100 in crate. $5.50. Matt Smith, Preston, Ia.

FOR SALE—Empty honey cans with cases, two to case, second-hand but in good condition, 50c case f. o. b. Kansas City. C. F. Schobert & Co., 112 West 4th Street, Kansas City, Mo.

SOUTHWESTERN distributors for Robinson's comb foundation. Cypress beehives, Italian queens. Our guarantee is not to be equaled. Send for price list. Holloway Bros., Marietta, Okla.

FOR SALE—Two or three Root hand and power extractors in four and eight frame sizes at specially low prices. If interested write us for particulars and prices. Dadant & Sons, Hamilton, Ill.

FOR SALE—Second-hand 5-gallon cans. Only good cans offered. Two cans each case. Per 10 cases, $6.50; per 25 cases, $15.00. Ask for price on quantity lot. A. I. Root Co., 230 W. Huron St., Chicago, Ill.

HONEY-NUT CHOCOLATES. A new and delicious confection made of pure honey, nuts, fruits, etc. $1.00 lb., 50c ½ lb., postpaid. Wholesale prices on application. J. D. Kroha, 87 North St., Danbury, Conn.

FOR SALE—500 lbs. medium brood foundation, standard size, in 5-lb. boxes, packed 4 to the carton, 52c per lb.; also 2-frame reversible extractor, good as new, $22.00; 30 new ventilated escape-boards, complete, $21.00; Hatch wax press, $7.00. Ray Wilcox, Odessa, N. Y.

FOR SALE—Two Root No. 15 reversible two-frame hand extractors, never uncrated, $36.00 each; 300 metal-spaced Hoffman frames, K. D., $8.00 per 100; lots of covers, bottoms, Danz. hives and many other items. Write for bargain list. C. C. Brinton, Bloomsburg, Penn.

SPECIAL PRICES—We are offering at specially low prices some very high-grade material in shipping cases, frames, hives and miscellaneous which represent items we no longer carry regularly in stock or which have to be closed out to make room for new stock specially equipped to take Dadant's Wired Foundation. If interested, write for list; we can save you money. Dadant & Sons, Hamilton, Ill.

WANTS AND EXCHANGES.

WANTED—Copy British Beekeepers' Guide Book. W. H. Humphries, Midvale, Va.

FOR SALE or exchange, 75 cases 60-lb. cans, good condition, for choice honey. H. Lauzon, 641 Peterboro, Detroit, Mich.

BEES AND QUEENS.

WHOLE colonies of bees, if advertised for sale in these columns, must be GUARANTEED free from disease, or advertiser must state he will furnish certificate of health from some authorized bee inspector.

HARDY Italian queens, $1.00 each. W. G. Lauver, Middletown, Pa.

WHEN IT'S GOLDEN, IT'S PHELPS! C. W. Phelps & Son, Binghamton, N. Y.

HIGH grade queens at utility prices. Write for circular. R. V. Stearns, Brady, Texas.

ITALIAN queens of quality, $1.00 each; $11.00 for 12. W. E. Buckner, Mt. Vernon, Ga.

SEND YOUR NAME for a good circular about GOOD queens. The Scott Apiaries, La Grange, Ind.

THREE-BANDED Italian queens, $1.25 each. $12.00 per dozen, after May 15. Curd Walker, Jellico, Tenn.

$70.00 per 100 we are asking for our June queens. Let our circular tell more about them. R. V. Stearns, Brady, Texas.

SIMMONS QUEENS and NUCLEI. Prompt shipment and satisfaction guaranteed. Fairmount Apiary, Livingston, N. Y.

FOR SALE—Three-banded, leather-colored queen bees. None better. Write for prices. M. Bates, Greenville, Ala., R. F. D. No. 4.

GOLDEN Italian queens bred by an experienced breeder. Price, $1.25 each; $11.00 per doz. Honoraville Bee Co., Honoraville, Ala.

FOR SALE—20 colonies bees 8 and 10 frame hives. Guaranteed free from disease. Wm. Ulrich, 5262 Langlade Ave., Chicago, Ill.

MY five-banded golden queens will be ready April 1. 1 queen, $1.00; 6 queens, $5.50; 12 queens, $10.00. W. W. Talley, Greenville, Ala., Rt. 4.

BRIGHT Italian queens, 1, $1.00; 12, $10.00; 100, $75.00. Write for prices on package bees. T. J. Talley, Greenville, R. F. D. No. 3, Ala.

FOR SALE—Bright Italian queen, $1.00; 6, $5.00; 1-lb. package bees with queen, $3.00; 2-lb. package with queen, $4.50. Powell Owen, Greenville, Ala.

SELLING Italian queens, $1.00; 3-frame nuclei, $5.00; full colonies, $10.00. Ask price on hives, supers. Guaranteed no disease. Hickory Shade Apiary, Otterville, Mo.

ITALIAN QUEENS—Three-banded, bright and leather-colored. Satisfaction guaranteed. Write for prices, etc. A. T. Keil, Treesdale Farms, Mars, Butler County, Penn.

GOLDEN ITALIAN queens, producing large beautiful bees, solid yellow to tip. Package bees, nuclei circular, 1924, ready free. Dr. White Bee Co., Sandia, Texas.

QUEENS cost $1.00 to $2.00. Rexford's Push-in-Comb introducing cage improved so as to release queen automatically; cost 35c; three, $1.00. It pays. Try it. O. S. Rexford, Winsted, Conn.

WARRANTED ITALIAN QUEENS mated pure at $1.25 each, mailed in sure introducing cages that never fail if colony is queenless. No honey used in candy. Daniel Danielsen, Brush, Colorado.

GOLDEN ITALIAN queens for sale. 1, $1.00; 6, $5.00; 12, $10.00; 100, $75.00. Package bees in season, 20 per cent to book your order for spring delivery. J. F. Rogers, Greenville, R. D. 3, Ala.

EIGHT colonies bees, hybrids and Italians. Guaranteed free from disease. Ready for increase. $8.00 each. Joe Gass, Tyner, Tenn.

BRIGHT three-band Italian queens, $1.00; 6 or more, 75c. Write for quantity prices. Tupelo Apiaries, J. L. Morgan, Apalachicola, Fla.

FOR SALE—150 colonies, guaranteed free from disease, in fine new hives, drawn combs. Entire outfit cheap. O. L. Rothwell, Gillett, Pa.

FOR SALE—25 colonies bees guaranteed free from disease, also extracting outfit. Can see bees and owner, J. R. Simmons, Matteson, Cook Co., I. C. Ry., Ills., June 1 to June 10.

FOR SALE—Three-banded Italian bees and queens. Two-pound package bees with select untested queen, $4.25. One select untested queen, $1.00; one select tested queen, $1.50. J. Allen, Catherine, Alabama.

JUST BRING HONEY (J. B. Hollopeter) three-banded Italian queens produce bees bred for business. Untested each, $1.25; 6, $7.00; 12, $13.00; 25, $25.00. Order early. Circular. J. B. Hollopeter, Rockton, Penn.

ITALIAN three-banded select untested queens for the rest of the season, $1.00 each; 6 for $5.00; 12 for $9.00. My queens will bring results. Try them while the price is low. H. S. Ostrander, Mellenville, N. Y.

FOR SALE—Three-banded Italian queens. Untested, 1 to 11, $1.00 each; 12 to 49, 85c each; 50 to 100, 75c each; tested, $2.00 each. Satisfaction guaranteed. Ready to ship June 1 to June 10. R. B. Grout, Jamaica, Vt.

DIXIE MAID Bright Italian Queens. Select untested, $1.25 each, $12.50 per doz. Untested, $1.00 each, $11.00 per doz. 2-lb. package, $5.00. Write for special prices on large orders. P. B. Skinner, Greenville, Ala.

GOLDEN Italian queens, untested, $1.00; 6 for $5.40; 12 or more, 80c each; tested, $1.50; select tested, $2.50. No disease, good queens, safe arrival and satisfaction guaranteed. D. T. Gaster, R. F. D. No. 2, Randleman, N. C.

AGAIN our northern-bred leather-colored Italian bees have wintered fine, and we guarantee that no disease exists in our yards. Queens after June 15, $1.25 each; $12.00 per doz. Charles Stewart, Johnstown, N. Y.

FOR SALE—Rule Brothers Straight-Line three-banded Italian queens, satisfaction guaranteed. Untested, $1.00; 25 or more, 90c; tested, $2.00; 25 or more, $1.75. Rule Brothers, Terlton, R. F. D. No. 1, Box 30, Okla.

100 COLONIES Italian bees, 10-frame, $10; 8-frame, $8.00. All Standard Root hives, all frames wired, all combs drawn from full sheets, guaranteed free from disease. George Biggs, 4431 Wrenwood Ave., Baltimore, Md.

PRICES right. Pinard's queens and package bees. Quality, satisfaction guaranteed. Young, laying, untested queen, $1.25. Two-pound package bees, $3.50. For larger lots write. Circular free. A. J. Pinard, Morgan Hill, Calif.

THREE-BANDED bees and queens, government inspected, 2-lb. package with select queen, $5.00; select tested queens, $2.50; untested, $1.00 each or $10.00 per dozen. Carolina Bee Co., W. O. Curtis, Mgr., Rt. No. 1, Graham, N. C.

FOR SALE—Three-banded Italian queens and bees ready for June 5 delivery. Price, 1 untested queen, 85c; 100, $80.00. One 2-lb. package with queen, $3.00 each. Health certificate with each shipment. John St. Romain, Marksville, La.

TEN colonies Root strain Italians, guaranteed free from disease. Root Excelsior ten-frame new hives, painted. Hoffman wired frames, combs from full sheets foundation. $15.00 each. John E. Everett, Bound Brook, N. J.

ITALIAN QUEENS, 1 to 5, $1.00 each; 6, $5.50; 12, $10.50; 1 lb. bees with queen, $3.00; 2 lbs. bees with queen, $5.00; 3 lbs. bees with queen, $7.00. We pay delivery charges up to Zone 6. Graydon Bros., Greenville, R. F. D. No. 4, Ala.

GOLDEN Italian Queens for 1924. The big bright hustling kind. Satisfied customers all over the U. S. Untested, $1.00 each; 6 for $5.00; 12 for $10.00; 100, $75.00; tested, $1.75. A few 2-frame nuclei at $4.50 with queen. E. F. Day, Honoraville, Ala.

FOR SALE—Golden Italian queens, untested, $1.00; 6 for $5.40; 12 or more, 80c each; tested, $1.50 each; select tested, $2.50 each. Write for price on large quantity. No disease of any kind. Safe arrival and satisfaction guaranteed. Sam Hinshaw, Randleman, N. C.

FOR SALE—Three-band Italian queens and bees for spring delivery. One 3-frame nucleus with one pound extra bees, with untested queen, for $5.00. Write for prices on larger quantities. No disease. Safe delivery and satisfaction guaranteed. J. E. Arthur, Register, Ga.

BUY ITALIAN bees from shipper farthest north. Get hardy stock and save expressage. Satisfaction guaranteed. 20 years' experience. Three-frame nuclei and tested queen, $5.00; select tested, $6.00. Orders booked for spring delivery by S. G. Crocker, Jr., Roland Park, Baltimore, Md.

THREE-BANDED LIGHT-COLORED ONLY—One-frame nuclei with untested queen, $2.00 each. In lots of ten or more, $1.90 each; additional frame of brood or pound of bees, 60c extra to each package. The above is for immediate shipment. Central Louisiana Apiaries, Oscar Mayeux, Prop., Hamburg, La.

QUEENS, QUEENS, BY RETURN MAIL. Three-banded, large, bright hustlers. Selected untested, 1, 80c; 12, $8.00; 100, $60.00; selected tested, 1, $1.25; 12, $12.00. No disease, ship only the best, good service and satisfaction guaranteed. W. C. Smith & Co., Calhoun, Ala.

FOR SALE—CAN SPARE IN JUNE or July several colonies best Italians, wired combs, built on full sheets foundation, 8 or 10 frame Langstroth hives. Also 5 second-hand Buckeye hives in good condition. Reasonable. Guaranteed free from disease. S. Cushman, 6 East Lake St., Chicago, Ill.

LATHAM'S "SHE SUITS-ME" queens are three-banders of highest quality. Untested, in May, $2.00 per queen. After June 1, $1.00 per queen. Special price on 50 or more. Eastern beekeepers and Canadians will do well to try out my package bees and nuclei. Circular on request. Allen Latham, Norwichtown, Conn.

FORTY YEARS of SPECIAL BREEDING. Satisfied customers in all parts of the world is why we think PHELPS' GOLDEN QUEENS will please you. HARDY, PROLIFIC and GENTLE, $2.00 each for June delivery. July, $1.50 each; 6 for $8.00; dozen, $15.00. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

GOLDEN Italian Queens. They are reared right from good stock and the price is right. 1, $1.05; 6, $5.50; 12 or more, 80c each; tested, $2.00 each. After July 1, 1, $1.00; 6, $5.25; 12 or more, 75c each; tested, $1.75 each. Safe arrival insured. Certificate of state inspector with each shipment. Hazel V. Bonkemeyer, R. F. D. No. 2, Randleman, N. C.

BOOKED to capacity for pound bees. Will be able to supply your wants for June delivery in two and three frame nuclei. Good standard Hoffman frames and a good untested Italian queen will be sent. Two-frame nuclei, $3.00; three-frame nuclei, $3.60. Safe arrival and satisfaction guaranteed. Health certificate accompanies each shipment. E. J. Beridon, Jr., Mansura, La.

PACKAGE BEES and ITALIAN or CARNIOLAN QUEENS. I save you express charges on northern shipments from my yards near Redding, Cal. (most northern point in California where EARLY PACKAGE BEES and QUEENS can be reared). Eastern and northern shipments via Ogden, Utah, are shipped from San Jose. Untested queens, $1.00; bees, $1.50 per pound. Attractive prices on large order. J. E. Wing, San Jose, Calif.

PACKAGE BEES FOR 1924—Yancey hustlers; they get the honey. Three-band strain only. Now booking orders for spring delivery. Place your order early and make sure of shipping date; 10 per cent will book your order. We do not book more orders than we can fill promptly. Safe arrival and satisfaction guaranteed on every package and queen shipped. Caney Valley Apiaries, Yancey Bros., owners, Bay City, Texas.

ON RECEIPT OF ORDER—Our nice strain of three-banded bees and queens, with a government health certificate; Standard frame nuclei with 2 pounds bees and a good selected untested queen, $2.95 each; 5 packages, $14.25; 10 packages, $25.00; each additional frame and brood, add 50c. If selected tested queen is wanted, add 75c. Safe delivery guaranteed. Address, with remittance, C. A. Mayeux, Hamburg, La.

THE WONDER QUEENS. We are now in position to ship queens from our high-producing mothers by return mail at the following prices: 1 untested, $1.50; 12, $16.00; tested, $2.25. We are also breeding from other stock at these prices: 1 untested, $1.00; 12, $10.00; tested, $1.75. No disease. Safe arrival and satisfaction guaranteed. Write for circular and complete price list, also prices on quantities. The steadily increasing demand for our queens is proof of their superior quality. J. M. Cutts & Son, R. F. D. No. 1, Montgomery, Ala.

PACKAGES and nuclei with selected untested Honey Girl queens; 3-lb. bees with queen shipped with stores on comb, $4.50; 10 or more packages, $4.00 each; 3-frame nucleus with queen, $5.00; 10 or more nuclei, $4.50 each; 5-pound swarms with queen with comb, $6.00 each; 4-frame nuclei with queen, $5.75 each. All combs first class in Root-Hoffman frames built on full sheets foundation and wired. Safe arrival, no diseases. Claims for damaged bees replaced immediately on receipt of express bad-order receipt signed by express agent. Certificate of inspection with each shipment. Advise your nearest open express station. Prices are for shipments to points in U. S. and Canada, f. o. b. our shipping point. Orders booked in rotation. White Clover Farm & Apiary, Hamburg, La.

HELP WANTED.

WANTED—Man with some experience to work bees, season 1924. State age, experience and wages, also give references. We also can furnish bees on shares. The Rocky Mountain Bee Co., Box 1319, Billings, Mont.

SITUATION WANTED.

A GERMAN beekeeper with 40 years' experience in apiculture and fruit culture desires situation to work with bees. Dapprich, 3228 W. 90th St., Cleveland, Ohio.

MISCELLANEOUS.

THE BEE WORLD—The leading bee journal in Britain and the only international bee-review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. The Apis Club, Benson, Oxon, England. Send us a postcard today. It is well worth your little trouble.

ONLY A FEW LEFT—SPECIAL PRICE.

Four-frame Novice Extractor, holds 4 regular Langstroth size frames, which are lifted out to reverse; well built and serviceable. A bargain at $33.00.

Root Capping-melter, just what the beekeeper wants who has 100 colonies or less. Special price, $12.00.

Solar Wax-extractor, will pay for itself in one season. The Doolittle with glass (14x26), $6.50; or the Boardman with glass (26x60), $19.50.

Dadant Uncapping-can, 20 inches in diameter, built in two sections with screen across bottom of upper half. Regular price, $22.00; sale price, $14.50.

F. O. B., Medina, Ohio. Cash with order.

THE A. I. ROOT COMPANY.

BIG, BRIGHT, NORTHERN-BRED ITALIAN QUEENS

Bred for beauty and honey-gathering qualities. Untested, $1.00 each; $11.00 per dozen.

M. P. LeMUNYON

R. F. D. No. 3, CASSOPOLIS, MICHIGAN.

GOLDEN QUEENS AND THREE-BANDED BEES FOR 1924.

1 Untested Queen, $1.00; 1 Tested Queen, $1.50; 1 lb. package of bees, $2.00; 2-lb. package of bees, $3.00; 3-lb. package of bees, $4.50. Nucleus, per frame, $1.50; 1 additional pound of bees with nucleus, $1.00. No disease, safe arrival guaranteed; bees inspected.

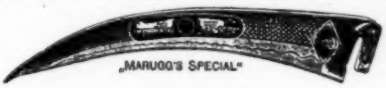
J. W. SHERMAN, VALDOSTA, GEORGIA.

ITALIAN QUEENS

THE QUALITY KIND.

Three-bands that hustle. Goldens that please. One, $1.00. Doz., $11.50. No disease. Satisfaction and honest service guaranteed. Send in your order; no regret will follow. Satisfied customers everywhere.

CRENSHAW COUNTY APIARY, Rutledge, Alabama, U. S. A.



The Apiarist's Friend,

GERMAN SCYTHES AND SICKLES.

Permit the maximum work with the minimum disturbance of the colonies. Catalog on request.

THE MARUGG CO., Dept. B, Tracy City, Tenn.

Delivered to you Free for 30 days trial on approval. Choice of **44 Styles**, colors and sizes of famous **Ranger** Bicycles. Express prepaid. Bicycles **$21.50** and up.

$5 a Month if desired. Boys and girls easily make the bicycle earn the small monthly payments.

Tires wheels and equipment at half usual prices. Write for remarkable factory prices and marvelous terms.

Mead CYCLE COMPANY DEPT. R 153 CHICAGO Write to us today

(Continued from page 365.)

formalin to 85 per cent of water is effective in destroying in 24 hours the spores of *B. larvae* as they occur in larval scales in open cells.

Although in our experiment a 48-hour immersion of the combs in the formalin and water mixtures gave us a hundred per cent sterile results in the cultures made from capped cells, we can scarcely expect that such would always be the case as the porosity of the cell caps varies considerably.

In view of the fact, however, that in our experiments the formalin-water mixture gave equally good results in the destruction of *B. larvae* spores as the formalin-alcohol mixture known as Hutzelman's Solution we are recommending its use in 20 per cent strength for brood-combs and super combs to Professor Millen, Apiculture Department, Ontario Agricultural College, for experiments on a large scale during the present season.

Owing to the fact that the odor of formalin remains on the treated combs for a considerable time after treatment, thus rendering the combs objectionable to the bees until the formalin has all passed away, an attempt was made to get rid of the formalin when taking the combs from the solution, and it was found that a thorough rinsing of the combs under the water tap for a few minutes removed all odor of the formalin.

A detailed account of the laboratory experiments and a full description of the apiary experiments will be published later.

Guelph, Ontario.

(Continued from page 387.)

the comb-honey super directly on the brood-chamber. In this case, most of the brood is left with the colony and most of the honey is taken away. for the brood-chamber should be almost entirely filled with brood at the opening of the honey flow. The hive body that is taken away can be given to a weak colony or used to make a new colony.

As mentioned last month, the first comb-honey super given should contain one or more sections with comb built the previous season, the remaining sections being filled with full sheets of foundation. A good rule to follow in giving additional comb-honey supers is to give a new super as soon as the bees have drawn out the foundation and started to build comb in the outside row of sections. This may be within three or four days after putting the super on. or it may be after ten days or more, depending upon the honey flow. If the bees start work throughout the super at about the same time, the new super should be placed beneath the partly filled one; but if they begin work only in the middle of the super and some sections are filled and partly sealed before the work is begun on the outer sections, the new super should be placed on top of the partly filled one.

TOO LATE FOR CLASSIFICATION.

FOR SALE—Orange honey in new 60-lb. cans, two, $14.00. F. E. Munson, Arcadia, Fla.

QUEENS — Yes, and a guarantee behind them that is unequaled. Let us tell you about it. Holloway Bros. Apiaries, Marietta, Okla.

WANTED—White clover and raspberry comb honey for resale. Highest fair market price paid. E. W. Peirce Co., 28 W. Main St., Zanesville, Ohio.

WANTED—Ambitious young man as apprentice to assist in handling 500 colonies. Give experience if any, and wages expected in first letter, and to start immediately. Earl L. Baker, Lake City, Mich.

WANTED—To trade capital stock of one of the largest bee-shipping companies in the South for bees in standard hives, located either in Nebraska, Iowa, Missouri or southern Minnesota. This bee company is absolutely reliable and invites investigation of its character and standing. It owns and operates hundreds of colonies of bees and guarantees 8% on preferred stock. This is a good investment in itself. If interested, write A. W. Nations, Donna, Texas.

Patents Practice in Patent Office and Court. Pat. Counsel of The A. I. Root Co. CHAS. J. WILLIAMSON, McLachlan Bldg., Washington, D. C.

Early Order Discounts

EVERYONE, including the bee-keeper, is looking for a way to save money—this is one of them.

SECTIONS, SECTION HOLDERS, SEPARATORS, HOFFMAN BROOD FRAMES—ALL AT LIBERAL DISCOUNTS. Write in for quotations on the supplies you need for the 1924 season.

Orders forwarded immediately on receipt. Newly manufactured stock on hand with more in the process.

Charles Mondeng

146 Newton Ave. N. and
159 Cedar Lake Road.
MINNEAPOLIS, MINN.

Mack's Queens

Are reared to suit the most particular beekeeper. They are hardy, gentle and very prolific. Every purchase must make us a satisfied customer or money back. Customers who purchased our queens sparingly the past season are now sending in their orders for 50 and 100 lots. If they did not satisfy, would such customers be so liberal? Just send for free catalog and read why they satisfy?

WE BREED THE THREE-BAND ITALIANS ONLY.

Untested—1 to 49, $1.00 each; 50 to 99, 95c each; 100 up, 90c each.

Select Untested—1 to 49, $1.25 each; 50 to 99, $1.20 each; 100 up, $1.15 each.

Capacity, 1000 queens per month.

HERMAN McCONNELL

ROBINSON, ILLINOIS.

Schenectady

is the best place to buy

Bee Supplies

in Eastern New York.

*****

A Full Stock of

Root QUALITY BEE SUPPLIES

*****

SEND IN YOUR ORDER NOW.

*****

Schenectady Bee Supply Co.

242 UNION STREET.

SCHENECTADY, N. Y.

Queens

The season is near when you will be in the market for queens, and I shall be pleased to supply you. I endeavor each year to produce queens just a little better than I did the year previous, to improve my stock a little and render just a little better service. I feel that for the season of 1924 I have several advanced features that will benefit my customers. A card will bring our literature.

QUEEN PRICES.

Before July 1.

1 to 4.....$2.00 each
5 to 9..... 1.95 each
10 or more. 1.90 each

After July 1.

1 to 4.....$1.50 each
5 to 9..... 1.45 each
10 or more. 1.40 each
Lots of 100 1.20 each

Breeding Queens, service guaranteed for the season, $10.00 each.

JAY SMITH

ROUTE 3. VINCENNES, IND.

Talking Queens

LAWS' LIGHT THREE-BANDED ITALIANS, IN TERMS OF STRONG COLONIES,

Tell the World

Their real value. Thirty-six years' advertising has spread Laws' queens over all the U. S. Millions of pounds of honey are sold annually, the product of Laws' queens. Better get your order booked early; you will then get what you want, and when you want it.

PRICES.

Untested, each, $1; 12 for $10; 100 for $80.
Tested, each, $1.50; 12 for $15; 100 for $100.
Breeding queens, none better, each $5.00.
Breeders guaranteed for at least one season's service.

REMEMBER THE NEW ADDRESS.

W. H. LAWS

BOX 425. WHARTON, TEXAS.

ROOT QUALITY
BEEKEEPERS' SUPPLIES

My spring stock is in and I can give prompt shipment; do not wait until the bees need them and can not get them in time for the honey flow. Beeswax wanted.

A. M. MOORE, ZANESVILLE, OHIO.
20½ South Third Street.

Root Quality Supplies

East St. Louis, Ill.

O. G. RAWSON, 3208 Forest Place.
Send for Catalog.

Authorized Distributor for St. Louis district.
BEES AND QUEENS.

American Beauty Italian Queens

Produce bees of superior quality. This year's breeder, selected from an 80-colony yard, gave a surplus of 100 lbs. by going one mile farther to a field of alsike clover. No other bees in this locality gave any surplus. These queens, on being mated to drones from the best high-producing strains, are gentle, hardy, very long-lived bees; much above the average in color. We guarantee purity and satisfaction. This is our 38th year. Untested, after June 15, $1.00 each. Tested, $2.00. Breeders, $5.00 and $10.00 each. No disease, safe delivery.

E. F. QUIGLEY & SON, Unionville, Mo.

GOLDEN ITALIAN QUEENS

1 Untested Queen.....$1.00
1 Tested Queen.....$2.00

Satisfaction guaranteed.
Queens ready by June 1.

J. F. MICHAEL
R. F. D. 1. WINCHESTER, IND

MASON BEE SUPPLY COMPANY,
Mechanic Falls, Maine.

From 1897 to 1923 the Northeastern Branch of The A. I. Root Company.
PROMPT AND EFFICIENT SERVICE.
Because—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily—Two lines of railway.
If you have not received 1924 catalog send name at once.

—QUEENS OF—
Moore's Strain

OF ITALIANS PRODUCE WORKERS
That fill the supers quick
With honey nice and thick.

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc.
Untested queens, $1.00; 6, $5.00; 12, $9.00. Select Untested, $1.25; 6, $6.00; $12, $11.00. Safe arrival and satisfaction guaranteed. Circular free.

J. P. MOORE, QUEEN BREEDER,
Route 1, Morgan, Kentucky.

Townsend's Bulletin No. 14

The Sensation of the Season!

I have told in my previous thirteen Bulletins some little part of the good qualities of the SHAW "line-bred" three-banded Italian queens, how they have been bred in line for a third of a century, beginning with imported stock, imported direct from Italy by the Shaws and how, by careful breeding and good judgment in selecting, they have bred up a very superior strain of bees; and I want to reiterate here that, if there are any bees in America that will duplicate themselves time after time, they are likely in the Shaw yards. After this prelude, I am ready to tell the readers of Gleanings that it is 48 years this month (June) since the writer began keeping bees and he has had bees ever since. During these years he, and later the boys in connection, have built up our bees until we now have something like 1400 colonies, worked for extracted honey, located in central Michigan. I am now ready to say something. The sensation mentioned is the fact that I have taken nearly 300 SHAW "line-bred" queens to our honey-producing yards in Michigan to be tested out for their honey-gathering qualities, and here is where my future breeding stock will be tested out. Testimonials prove conclusively that there is no better honey-gathering strain than the "line-bred" stock, but I propose to make them better by selection. Here is another point. These queens were sent home last season, but not early enough to test out their honey-gathering qualities last summer; a great share of them were genuine SHAW queens. They will be tested out this summer for their honey-gathering qualities, and those showing merit will be used as my future breeders. I also expect to have several of these tested for honey queens for sale immediately after the close of the honey flow, which ends with us the middle of July. This will be early enough, so many queens can be bred from them during late summer and fall. I consider these SHAW "line-bred" queens, tested for their honey-gathering quality, will be cheap at $50.00 each. Any one interested in bettering his stock of bees with the SHAW "line bred" stock kindly write me at my home in Northstar, Michigan. E. D. Townsend, Successor to J. W. K. SHAW & CO., Loreauville, La. "Where the good queens come from."

Goldens Only

Untested: One, $1.00; 6, $5.00. Select Untested: 1, $1.25; 5, $5.00. Select Tested, $3.00. Breeders, $5.00. Quality and safe delivery or money back.

S. H. HAILEY

PINSON, TENNESSEE.

Gray Carniolans

are hardy, gentle, extremely prolific and as honey-gatherers are unexcelled. Highly disease-resistant, winter admirably and build up very quickly in the spring. We are breeding from the finest American-bred stock in the U. S. as well as from selected breeding mothers imported in 1923 direct from Carniola.

WRITE **for my free 8-page circular** which gives you every detail relative to this wonderful bee. It is the most complete treatise ever written on the subject. Write for it today.

W. A. HOLMBERG, DENAIR, CALIFORNIA.

HIGH-GRADE ITALIAN

Queens

By Return Mail.

Select Untested, 1 to 9, $1.00 each; 10 or more, 90c each. Select Tested, after June 20, $2.00 each.

FRANK BORNHOFFER

TOBASCO, OHIO.

(Formerly of Mount Washington, Ohio.)

World's Best Roofing
at Factory Prices
"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Save money—get better quality and lasting satisfaction.
Edwards "Reo" Metal Shingles
have great durability—many customers report 15 and 20 years' service. Guaranteed fire and lightning proof.
Free Roofing Book
Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No 183
LOW PRICED GARAGES
Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.
THE EDWARDS MFG. CO.
633-683 Pike St. Cincinnati, O.
FREE
Samples & Roofing Book

CARNIOLANS

of a pure and well-bred strain show the following traits to a high degree: They are very prolific at all times, very gentle, build very white combs, gather but little propolis, little inclined to rob, are a long-tongued bee and will work industriously on red clover, are especially fine workers on buckwheat, resist brood diseases as well as any race or strain of bees, and do not swarm excessively if intelligently managed. Ask for my free paper, "**MERITS OF THE CARNIOLAN BEE.**" It outlines successful plans of managing this race of bees.

I can supply Carniolan queens of my own strain, 12 years' selection and breeding; **JON STRGAR, CARNIOLA, EUROPE, strain.** Breeders imported 1923; Italian, C. B. Hamilton strain. The mother of this breeder produced 577 finished sections of comb honey.

1 untested queen (either strain).....$1.50
12 untested queens (either strain)....16.00
Tested queen (either strain) 2.50

Safe arrival by mail and satisfaction guaranteed.

ALBERT G. HANN

GLEN GARDNER, NEW JERSEY.

Mott's Northern-Bred Queens

Select Untested till June 1; $1.25 each; $1.00 each thereafter. Select, guaranteed pure mated, $1.25 each. Select Tested, $2.00. Virgins, 50c. 1 and 2 pound packages in June. 172 miles east of Windsor, Ontario. Save two days' trip from the far south.

E. E. MOTT, Glenwood, Mich.

"BEST GARDEN TOOL I EVER USED"
Keep the weeds out and the surface mulched to hold the moisture—that's the secret of gardening. You'll enjoy doing this with a
BARKER Weeder, Mulcher and Cultivator
8 revolving blades and underground knife kill the weeds and in the same operation chop the surface into a perfect mulch. "Best Weed Killer Ever Used." Cuts runners. Has leaf guards; also shovels for deeper cultivation. A boy can use it, and do more and better work than 10 men with hoes. Valuable garden book free, describes Barker and its work, gives prices delivered, etc. Write today.
GARDENING
Send for FREE BOOK
BARKER MFG. CO.
David City, Nebr.
Box 224

What a Whale of a Difference Just a Few Cents Make!!!

Good queens are absolutely necessary if you are to succeed with bees. The price of a cheap queen plus the price of a pound or two of honey brings one of our dependable queens that may mean many extra pounds of honey for you. Every queen laying and laying well before mailing.

Golden or Three-banded queens ready June 1, untested only. One, $1.50; doz., $15.00.

Orders booked now; no deposit required.

THE SCOTT APIARIES, LA GRANGE, IND.

GOLDEN ITALIAN QUEENS BRED FOR BUSINESS

Only one grade select. Safe arrival and satisfaction guaranteed.

Untested, 1, $1.25; 12, $12.00. Tested, $2.50 each.

1-lb. pkg. of bees and untested queens, $3.00; 2 lbs., $5.00. All mail charges paid.

E. A. SIMMONS - - GREENVILLE, ALABAMA.

GET THE BEST

Pure 3-band Italian stock, a continuous honey flow from March to December, with 29 years' experience in rearing queens enable me to rear the best to be had. Untested: 1, $1.25; 6, $6.50; 12 or more, $1.00 each. 20 per cent books orders. H. D. MURRY, Magnet, Texas.

JUNE AND JULY

is the time to try our high-grade Italian queens, guaranteed to satisfy or your money back. $1.00 each, $10.00 per dozen, $80.00 per hundred. You will be pleased with our stock. J. J. SCOTT, CROWVILLE, LA.

Queens

$1.00 each; 6 for $4.75; $9.00 dozen.. Pure three-banded Italians. No better queens reared.

G. H. MERRILL, PIEDMONT, S. C.

Italian Queens
MURRY QUALITY

Am only offering untested queens for sale now, but they are beauts. One untested, 90c; 12, $9.50; 50 or more, 75c each.

H. L. MURRY, SOSO, MISSISSIPPI.

THREE-BAND ITALIAN QUEENS

UNTESTED, 75c EACH; 50, AT 70c EACH; 100, at 65c EACH. TESTED. $1.50 EACH. EXTRA-SELECT, $3.00 EACH. Safe arrival and satisfaction guaranteed.

D. W. HOWELL, SHELLMAN, GEORGIA.

Uniformly Marked **BEELINE QUEENS** Good Honey Gatherers

They are the best of Pure Golden Italians, reared, selected and caged right, and guaranteed to give satisfaction. Untested, $1.25 each; Select Untested, $1.75 each. Tested, $2.50 each. Write for descriptive booklet.

MAJORS NORDAN, BOX 113, KIMBERLY, ALABAMA

2 AND 3 POUND **PACKAGE BEES** 2 AND 3 POUND

NONE BETTER AT ANY PRICE.

2-lb. package of Italian Bees with select Italian queen.....$5.50; 5 or more, $5.00
3-lb. package of Italian Bees with select Italian queen.....$6.50; 5 or more, $6.00
Special prices on quantity lots.
Receive FRESH bees, and SAVE express charges. Illustrated circular free.

VAN'S HONEY FARMS, HEBRON, IND.

Bee Supplies

We make a specialty of manufacturing comb-honey sections and ship millions of sections each year to all parts of the country. Samples sent free upon request. We also manufacture comb-honey shipping cases and section holders in large quantities.

To complete our line we carry a full stock of the well-known "Root Quality" hives, bodies, supers, frames, Airco three and single ply comb foundation and other goods. Send us your orders; we are prepared to give you the best quality and service at all times.

Write for our free illustrated catalog.

AUGUST LOTZ CO.
BOYD, WISCONSIN

HONEY CONTAINERS

2½-lb. cans, per carton of 100	$4.25
5-lb. pails, per carton of 50	3.50
5-lb. pails, per carton of 100	6.75
10-lb. pails, per carton of 50	5.00

Above packed in cartons which are dust-proof, light and easy to handle, keeping your cans and pails clean until you are ready to use them.

5-lb. pails, per case of 12	$1.10
10-lb. pails, per case of 6	.90
60-lb. cans, 1 per case	.90
60-lb. cans, 2 per case	1.25

Above packed in wooden reshipping cases.

GLASS JARS

8-oz. honey capacity, tall or fluted, per case of 24	$1.05
8-oz. honey capacity, medium, per case of 24	.95
16-oz. honey capacity, tall or fluted, per case of 24	1.35
16-oz. honey capacity, medium, per case of 24	1.25
32-oz. honey capacity, per case of 12	1.00

All above prices f. o. b. Reedsville, Wis. Write for prices on larger quantities of pails and glass jars, stating number and sizes wanted.

A. H. RUSCH & SON CO.
REEDSVILLE, WISCONSIN

SERVICE

The most important factor in giving the beekeepers complete **SERVICE** is transportation facilities. Syracuse is located right in the **CENTER** of the **BEST BEEKEEPING** territory in the U. S. A. Motor trucks are leaving Syracuse daily going in every direction, freight and express service are the best. Seventy pounds can be sent by parcel post. We also have the best roads to be found anywhere. If you own an auto you can drive into Syracuse, and know that you will get the supplies that you need and be back home the same day. Drive right in to our place. **NO PARKING LIMIT.**

Complete stock of **ROOT QUALITY SUPPLIES** all the time.

A. I. ROOT CO. of SYRACUSE

1631 West Genesee Street,
SYRACUSE, N. Y.

SERVES YOU BEST

ASK DAD, HE KNOWS.

Bee Supplies

We Handle the Best Bee Supplies.

PROMPT SERVICE
SAVE FREIGHT
QUALITY GOODS

Ask for 64-page Catalog.

Root QUALITY BEE SUPPLIES

F. Coombs & Son
Brattleboro, Vermont

New Catalog Ready
Beekeepers' Supplies

Root's Goods of High Quality. Three-ply foundation, standard stock of supplies kept on hand for prompt shipments. Send us your inquiries and orders early for quick action.

J. NEBEL & SON SUPPLY CO.
Montgomery County. High Hill, Mo

NOTICE OF REMOVAL

On and after March 1st, I shall be located in my new warehouse at 237 Park St., Medford, where I shall continue to carry a full line of supplies for the beekeeper. 1924 catalog on request.

H. H. JEPSON
237 Park St. Medford, 55 Mass.
(Formerly at 182 Friend St., Boston.)

4% BANKING BY MAIL

THE HOME OF THE HONEY-BEE

MANY of our customers live some distance from Medina, and find it just as safe and convenient to bank with us by mail as if they visited the bank in person. An inquiry will not obligate you.

Capital, Surplus and Undivided Profits—more than $130,000.00

THE SAVINGS DEPOSIT BANK CO. MEDINA OHIO
A. T. SPITZER PRES. E. R. ROOT VICE PRES. E. B. SPITZER CASHIER

BEE SUPPLIES

Root Quality Bee Supplies are standard everywhere because they are the best. *We carry a complete line.*

Root QUALITY BEE SUPPLIES

SEND FOR 64-PAGE CATALOG.

A. I. ROOT COMPANY OF ST. PAUL
289 EAST SIXTH STREET. ST. PAUL, MINNESOTA

You can have cash for your wax and old combs or cappings at the market price, or we allow a little more in exchange for supplies. Write for our terms and prices.

"Falcon"

SUPPLIES ---- QUEENS ---- FOUNDATION

W. T. Falconer Mfg. Company
Falconer, New York (near Jamestown)
"Where the best beehives come from."

Ask for catalog. *Booklet, "Simplified Beekeeping for Beginners," free.*

MIDDLE TENNESSEE BRED

Select Three-Band and Golden Italian Queens will please you. Place your orders now for May first deliveries.

—PRICES—

Untested—1, $1.25; 6, $7.00; 12, $14.00. Select Untested—1, $1.50; 6, $8.00; 12, $16.00. Select Tested—1, $2.50, 6, $12.00; 12, $22.00.

Write for descriptive circular and prices per hundred.

All correspondence will receive prompt and careful attention.

MIDDLE TENNESSEE APIARIES

HARDIN S. FOSTER, Manager.

COLUMBIA, TENNESSEE.

Achord's Bees and Queens for 1924

QUEENS.

Select untested, $1.25 each; ten, $11.50; twenty-five, $25.00. Select tested queens, $2.00 each.

TERMS: 20 per cent with order to secure reserved shipping date. Balance just before shipment. Safe arrival guaranteed. No bee disease in this district. Inspection certificate with every shipment.

We have two of the largest, best equipped queen-rearing apiaries in the South, also a series of outyards of fine honey-producing three-banded Italian bees which we run exclusively for package bees. We can give you the very best in bees, queens and service.

W. D. Achord, Fitzpatrick, Ala.

Queens CONNECTICUT *Queens*

UNTESTED JUNE 1.

We ship only the highest quality three-banded Italian Queens and Bees.

1	$ 1.00
12	11.00
50	47.00
100	90.00

TRY US FOR QUALITY AND SERVICE.

QUEENS NEA

We guarantee satisfaction, safe arrival and freedom from disease or money refunded.

PACKAGE BEES AND NUCLEI WITH QUEEN.

2 lbs. $4.50 ea., 10 or more, $4.00 ea.
3 lbs. $5.50 ea., 10 or more, $5.00 ea.
2-frame Nuclei ..... $4.50 ea.
3-frame Nuclei ..... $5.50 ea.

THE NEW ENGLAND APIARIES

NEW BRITAIN, CONNECTICUT

YOU BUY *BEES AND QUEENS* IN ONE OF TWO WAYS

? *On Trust or On Certainty* 4-hands

You either know you are going to get good queens and bees or you hope you are. Hope may result in poor stock, delay, loss of colony and no honey. Knowledge means first-class stock, prompt delivery, courteous treatment, satisfaction and profit.

When you mail your order to FOREHAND you know you are buying QUEENS AND BEES on certainty. How about your next order?

Untested queens, 1 to 12, $1.00 each; 12 to 25, 85c each. One lb. bees with queen, $3.25; two lbs. bees with queen, $5.25; three lbs. bees with queen, $6.25; 10 or more packages of either, 25c less per package. POSTAGE PAID ON BEES AND QUEENS. Satisfaction and safe delivery guaranteed. REMEMBER THE PRICE IS PREPAID ON PACKAGE BEES. Write for prices on large lots.

N. FOREHAND -:- GONZALEZ, FLORIDA

Ohio Valley Queens

For Quality
For Service

Our aim and wishes are to please you, and our best advertisement is to fill your order, large or small, with queens of the best honey-gathering strain it is possible to rear.

PRICES OF OUR QUEENS.

Untested, 1 to 12 .....$1.00 each
Select Untested, 1 to 12 .... 1.25 each
Select Tested, after June 15. 1.75 each
Virgins (not mated) ..... .50 each

FRAMES.

We have just taken the sale of the Russell patent frame. Being standard in size, self-spacing and fits all standard hives. We are sure you will like it and offer you the frame at these special prices: 25 for $2.00; 50 for $3.25; 100 for $5.75.

Ohio Valley Bee Co.

CATLETTSBURG, KY.

Selected Queens

QUEENS BY RETURN MAIL

Our queens are giving wonderful results; their colonies are producing large yields of honey. Try them and be pleased as others are. Mr. J. C. Smith, Washington, D. C., states: "I have never made a purchase that gave the satisfaction that your queens did; their quality was extremely high and I have never had better." We guarantee every queen we ship to give entire satisfaction. Pure mating, safe arrival and prompt delivery guaranteed. Wings clipped free of charge on request.

PRICES.

Select Untested .....**$0.75 each**
50 or more ..... **.65 each**
Select Tested ..... **1.50 each**

Hayneville Apiary Company

Hayneville, Alabama

Leininger's Strain of Italians

We have been queen-breeders for nearly 50 years. In all this time we have tested nearly every strain of Italian bees in the U. S. A. By this careful selection and breeding we have succeeded in producing a strain of bees surpassed by none but superior to many, bees that are gentle and great honey gatherers.

Therefore if you buy queens from us you may be assured that back of them are nearly 50 years of careful breeding for the production of honey.

As we are located in a red clover belt, it is but natural that our bees should have a long-tongue reach.

We will sell queens from this superior strain as follows:

Untested, 1 to 5, $1.00 each; 6, $5.50; 12, $10.50; 100, $85.00.

Tested, $1.50 each; select breeders, $5.00 to $10.00 each.

Safe arrival and satisfaction guaranteed.

Fred Leininger & Son

Delphos, Ohio

Make 1924 a Success by Buying

Collier's Italian Bees and Queens

I do not claim to have the best bees in the South, but I do claim to have as good as can be bought. They are gentle, prolific and the best of honey-gatherers. To know them, try them. If you are not satisfied I will replace or refund your money. Your money's worth or your money back. You are the judge. My aim is quality, quantity and quick service. Safe delivery guaranteed in U. S. A. and Canada. Orders will be shipped on a specified date.

PRICES—QUEENS.

	1	6	12	100
Untested	$1.00	$5.75	$11.00	80.00
Sel. Unt.	1.25	6.50	12.00	90.00
Sel. Tested	3.00 each.			

Pound Packages with Select Untested Queens.

	1 to 12.	12 or more.
2-lb. package	$4.50 each	$4.25 each
3-lb. package	5.25 each	

D. E. COLLIER

Ramer, Alabama.

Honey Containers

That Will Sell Your Honey Well

LITHOGRAPHED HONEY PAIL—

The only soldered non-leak lithographed honey pail on the market.

CARTONS FOR COMB HONEY—

Attractive, sanitary and printed in colors.

ROUND GLASS JARS—

Your honey sells best in white glass jars with attractive labels.

GLASS TUMBLERS—

PLAIN TIN CONTAINERS—

PARCEL POST CANS—

COMB HONEY SHIPPING AND DISPLAY CASES—

CORRUGATED SHIPPING CASES—

Built to meet the requirements of the railroads. However they must be crated the same as other cases.

WOOD SHIPPING CASE.

SEND FOR FREE BOOKLET

"HOW TO SELL HONEY."

Root QUALITY —BEE SUPPLIES—

THE A. I. ROOT COMPANY

WEST SIDE STATION

MEDINA, OHIO, U. S. A.

Root QUALITY —BEE SUPPLIES—

Queens---Rhode Island---Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, $1.25 each; 6 for $7.00.

Queens delivered after June 1.

O. E. TULIP, ARLINGTON, RHODE ISLAND.
56 Lawrence Street.

$1 and $1.50

MAJOR'S IMPROVED QUEENS OF SUPREME QUALITY.

Three-banded Italian Queens.

So many beekeepers lose good queens in introducing them. After several years of using push-in-the-comb cages, I am thoroughly convinced the push-in-the-comb cage is the only cage to use for safe introduction of queens. For that reason I have invented a push-in-the-comb cage, one that will go through the mail with candy, bees and queen already in the push-in-the-comb cage. No extra work to introduce queens in my new cage. The kind of letters I received daily:

"Duanesburg, N. Y., July 12, 1923.
"H. N. Major, South Wales, N. Y.
"Dear Sir—The queens arrived in fine shape and are dandies; this is the third season I have ordered queens from you. I find that your bees are hustlers, gentle, evenly marked and, the best of all, they winter well in this cold climate. In the last eight years I have had queens from over a dozen queen-breeders, and I consider yours the best. I wish I had my 275 colonies all headed with your queens. Respectfully yours, Seward Van Auken."

I guarantee pure mating, safe arrival, free from disease. All orders greatly appreciated and acknowledged the same day as received. Order now to avoid delay.

Select untested queen in my push-in-the-comb cage, $1.50 each. Select untested in small mailing cage, as we always used, $1.00 each. Make all foreign money orders payable to post office of East Aurora, N. Y. (not including Canada).

H. N. MAJOR, SOUTH WALES, N. Y.

Italian Queens

Can also furnish a few Goldens. Untested, $1.00 each; 6, $5.50; 12 or more, 90c each. Satisfaction, prompt delivery and safe arrival guaranteed.

RONALD KIRK, ROCKTON, PA.

DO YOU WANT A BIG HONEY CROP?

THEN HEAD YOUR COLONIES WITH OUR IMPORTED STOCK FROM ITALY.

Mr. Albert Peterson, Turtle Lake. Wis., writes: "Your queens have given me the very best satisfaction. My best colony last year was headed with one of your queens which stored 325 pounds of clover honey."

THAGARD'S ITALIAN QUEENS

BRED FOR QUALITY

have stood the test with backlotters and America's greatest honey producers. They are hardy, gentle, prolific and wonderful honey-gatherers.

Untested: 1 to 4, $1.00; 5 to 11, 80c; 12 to 25, 75c. Write for prices in large lots.

THE V. R. THAGARD CO.

GREENVILLE, ALA.

"The World is Our Market"

Benninghof Farm Queens

PRODUCTION, GENTLENESS, COLOR

For the first time in 1923 we brought to the attention of the American beekeepers our strain of Italian Bees, which we had been perfecting for the previous 20 years, to secure a race of bees superior to any that could be purchased.

In order that the beekeepers of the country might share in the advantages of these superior bees we offered for sale to interested parties a limited number of these excellent queens.

The results last season were so highly satisfactory to our customers that we again place before the discriminating beekeeping public our superior queens.

	1	6	12
UNTESTED	$1.50	$ 8.00	$15.00
TESTED	2.50	13.00	25.00

For fall requeening in 100 lots on application.

BENNINGHOF FARM, STATION F, COLUMBUS, OHIO

Honey for Sale---Case or Carlot

June Delivery on

Berry's Queens and Package Bees

Transportation Paid

After 28 years of select breeding our strain of three-banded Italian bees continue to excel for gentleness, disease-resisting qualities and honey production. "'Nough said."

PRICES, TRANSPORTATION PREPAID

1-lb. packages with select queens, $3.25 each; 12 up.....$3.00 each
1½-lb. packages with select queens, $4.25 each; 12 up.....$4.00 each
2-lb. packages with select queens, $5.25 each; 12 up.....$5.00 each
3-lb. packages with select queens, $6.25 each; 12 up.....$6.00 each

Untested Select Queens.....$1.00 each; 6 for for $5.50; 12 up, 75c each
Tested Select Queens.....$2.25 each; 12 up, $2.00 each

We guarantee our bees and queens to arrive in good condition and to give entire satisfaction. Otherwise we will replace or return your money, as you may prefer.

M. C. Berry & Co., Box 697, Montgomery, Ala.

QUEENS 75c

BY RETURN MAIL

Mr. Beekeeper, now is the time to give NORMAN BROS.' 3-banded Italian Queens a trial.

Head your colonies with a 75c queen, not a cheap queen but a queen of the best at a cheap price and watch them build up and prove to your satisfaction. You risk not a brown penny; if you are not satisfied, just return them, and we will replace or refund your money. Isn't this a fair proposition to any one that purchases queens? When you introduce NORMAN BROS. queens, beekeepers, you can feel assured you have a good queen, one that will do her duty and as good as can be bought for the money; you will have a queen which is backed by years of improving and selecting from the finest mothers and mated to drones that are selected. Our bees are hardy, prolific, disease-resisting and honey-gatherers.

PRICES JUNE AND JULY.

	1	6	12	100
Unt. Queens	$0.75	$4.40	$8.50	$65.00
Select Untested	.90	5.25	10.00	75.00
Tested Queens	1.50	9.00	17.00	
Select Tested	1.75 each.			

Guarantee.—We guarantee pure mating, safe arrival, free from disease and satisfaction in U. S. A. and Canada.

NORMAN BROS. APIARIES

NAFTEL, ALABAMA

WHO CARES?

We don't care what you are accustomed to pay for the queens you have purchased. Price alone adds nothing to the value of a queen. You want to get the very best queens it is possible to produce. We are in the field to meet this demand, and **AT A PRICE THAT IS FAIR.**

In point of years in the business many have us beaten. **TEN YEARS OF QUEEN-REARING SERVICE TO THE AMERICAN BEE-KEEPERS, IN THE QUEEN CENTER OF THE WORLD**, has gained for us experience and a knowledge of the art, probably enjoyed by few.

With the rush of the package season over, we can divert our every attention to our queen business, which is increasing by leaps and bounds. Our capacity is now 1200 queens per month. Still we are hard pressed to get all of them out on schedule. **NOW, WHO CARES?** "The hundreds who buy our queens."

Nothing but the best is good enough for our customers. We guarantee: Pure mating, absolutely no disease, safe arrival and satisfactory service after proper introduction.

Do you care for **QUALITY, SERVICE** and **A SQUARE DEAL?** Then address your orders to

Jensen's Apiaries

Crawford, Miss.

"WE CARE FOR YOUR QUEEN WANTS."

Untested, $1.00 each; $11.00 dozen; $75.00 per hundred. Select untested, $1.20; $13.00 dozen. Tested, $1.50. Breeders, $5.00. For delivery after July 1st, discount 10%.

32 YEARS AGO

Commercial queen-rearing was in its infancy. The shipping of bees in combless packages was unheard of.

Our years as specialists in this business date back to 1892. We commenced almost at the beginning and have grown with the industry.

Not only have we grown in size, but the fine qualities of our strain of bees and our good service have improved with the passing years.

Today we offer you service that really pleases and a strain of bees that is THRIFTY. We offer you the results of over a quarter of a century's work and study among the bees.

If you have not tried our thrifty bees and good service, may we not send you our descriptive literature?

UNTESTED QUEENS: 1, $1.00; 12 to 25, 85c; 25 to 50. 80c. Larger quantities and other grades upon application.

POUND BEES by express and parcel post at attractive prices.

W. J. FOREHAND & SONS

FORT DEPOSIT, ALABAMA

Good Queens Pay for Themselves

Only prolific queens can give the thousands of nectar-gatherers necessary to harvest a 100 per cent crop.

MAKE YOUR COLONIES STRONG NOW WITH

Citronelle Queens

Queen-rearing has been our life study. Satisfaction guaranteed or money refunded.

Three-Banded or Golden Queens after April 1.

Select Untested—1 Queen, $1.20; 12 Queens, $11.00; 100 Queens, $85.00.
Untested—1 Queen, $1.00; 12 Queens, $10.00; 100 Queens, $75.00.
Tested—1 Queen, $1.50; 12 Queens, $17.00. Breeders, $5.00 to $25.00 ea.

Golden queens are reared five miles from other breeding yards. Package bees, nuclei or full colonies quoted on request.

BOOK YOUR ORDER EARLY. ONLY 10% REQUIRED. BALANCE BEFORE SHIPMENT.

The Citronelle Apiaries

Citronelle, Alabama

CONNECTICUT VALLEY APIARIES

Offer you "PRODUCTION BRED" Italian Bees and Queens

From queen and drone mothers that are carefully selected. Our stock is hardy, gentle, very prolific and is winning favor as a honey-producing strain wherever it is introduced, both here and abroad.

Ready June 1. Untested queens. 1, $1.00; 12, $12.00; 50, $47.50; 100, $90.00.

Package bees and nuclei with queen: 2 lbs., $4.50; 3 lbs., $5.50; 2-frame nuclei, $5.00; 3-frame, $6.00. Safe arrival and satisfaction guaranteed.

A. E. Crandall

Berlin, Connecticut

We Have Reduced Our Glass and Tin Honey Container Prices

2½-pound Cans in crates of 100	$3.50 per crate
5-pound Pails in crates of 100	6.50 per crate
10-pound Pails in crates of 50	5.00 per crate
60-pound Tins, new, 2 tins per case	.90 per crate

GLASS JARS WITH GOLD-LACQUERED CAPS

8-ounce capacity, 3 dozen per carton	$1.35 per carton
16-ounce capacity, 2 dozen per carton	1.20 per carton
3-pound or quart, 1 dozen per carton	.90 per carton

HONEY

Wyoming Water White Clover, 60-lb. tins crystallized	13c per lb.
Light Amber West Indian 60-lb. tins, liquid	11c per lb.

HOFFMAN & HAUCK, Inc., Woodhaven, N. Y.

1331 OCEAN AVENUE.

QUEENS QUEENS

SUPERIOR ITALIAN QUEENS

STOP! LOOK! LISTEN!

So far as your 1924 crop is concerned, this is the most important month. Failures and delays will mean so much to you that you can not afford to take a chance on placing your order. We are going to tell you what we have; you can be the judge whether or not you can afford to risk us with your orders for QUEENS. We have everything else out of the way and not a thing to do but take care of your orders for queens. We have 2000 nucleus mating queens. We have every bit of this equipment in the best possible condition for producing the most and ABSOLUTELY THE BEST QUEENS THAT IT IS POSSIBLE TO PRODUCE. Everything that forethought can supply is ready to handle your order to your entire satisfaction. We have sufficient and competent office help that will acknowledge every order, whether for one or one thousand queens, and advise you when you can expect your queens. Most of the time we are able to ship orders of 100 within two days of receipt. If you are in a rush, get your bank to wire night letter for queens you want, and guarantee payment The time you will save will more than pay for the message.

Two-pound package or two-frame nucleus with queen, $4.50; ten or more			$4.00
Three-pound package or three-frame nucleus with queen, $5.50; ten or more			$5.00
One Untested Italian Queen	To June 15th, $1.25;	after June 15th,	$1.00
Ten or more	To June 15th, $1.00;	after June 15th,	.75
One Tested Italian Queen	To June 15th, $2.00;	after June 15th,	1.25
Ten or more	To June 15th, $1.50;	after June 15th,	1.00

A FULL LINE OF SUPPLIES. SEND FOR CATALOG.

THE STOVER APIARIES, MAYHEW, MISS.

QUEENS KNIGHT'S QUEENS QUEENS

are Line-Bred, Pure Three-Banded, Leather-Colored

For hardiness, prolificness, gentleness and honey-gathering qualities they cannot be excelled. Mr. C. F. Brown. Fairchild, Wis., writes: "The colonies headed with your queens wintered the best of any of them. Am 68 years old, having handled bees for 52 years. Think I am competent to know what constitutes a hardy strain. Yours are the best I ever owned."

Prices Balance of Season. Select (one grade) Untested.

1 to 4 inclusive	$1.00 each
5 to 9 inclusive	.90 each
10 to 24 inclusive	.80 each
25 or more	.75 each
Tested Queens	2.00 each

Shipment can be made by return mail or on dates to suit purchaser. Safe arrival, pure mating, perfect queens, and perfect satisfaction guaranteed. No disease.

JASPER KNIGHT, HAYNEVILLE, ALABAMA.

QUEENS 45 CENTS EACH QUEENS

During the balance of season we will sell Quality Queens at the above price. Over 1500 mating nuclei will be run for Summer Queens. Note the following testimonial:

"I like your queens very much and am using them for queen-rearing. They are prolific, keeping the cells filled to the top-bar. I have two batches of cells under construction and expect to rear some from each queen, so that if any of the queens should die I will have some of her strain in my yards."—Mathilde Candler, Cassville, Wis.

I can ship a few three-frame nuclei with Italian Queens during June and July at $4.50 each. They will each contain an extra pound of bees. The following testimonial just received from Mr. A. S. Crooker, 357 Atlanta St., Pasadena, California:

"Bees arrived April 25th, 1924, in fine condition. There was not more than a cup of dead bees, which is quite remarkable considering that they must have been on the road more than a week. The queen was in perfect condition. I placed them in the hive about eleven o'clock and they went to work at once."

I guarantee safe arrival and absolutely free from disease. Tested queens, $1.00 each.

Root Quality Supplies, Full Stock at all Times

A. R. IRISH, BOX 134, SAVANNAH, GEORGIA

Root's Roadside Sign

Neat, Attractive Letters Quickly Changed

Weather Proof Readable from Any Angle

ROOT'S ROADSIDE SIGN is the best and cheapest sign offered the roadside seller today. The sign that says **STOP** and **BUY**. Your profits for one day will more than pay for the sign. Letters easily removed and changed as illustrated. Furnished in two sizes and either single or double face with complete sets of water-proof wooden letters and figures. (Double-faced sign has two complete sets of letters and figures.) Remember other signs with quickly removable letters will cost you very much more. Order your sign now and have it when your honey, fruit, vegetables, etc., are ready to sell.

EARLY ORDER OFFER.—Upon deposit of $1.00 with order we will ship roadside sign C. O. D. for balance. Send in your order with $1.00 now. This will insure your getting your board by July 15. If not satisfactory we will refund your money.

1½ x 3-foot size, single face (70 letters and figures) $4.95
2 x 3-foot size, single face (88 letters and figures) 7.45
Small size (double face), $7.95; large size (double face), parcel post or exp. charges ex., $11.45

THE A. I. ROOT COMPANY, MEDINA, OHIO, U. S. A.

A SUPERIOR QUALITY AT LESS COST

SUPPLIES

MADE BY THE DIAMOND MATCH CO.

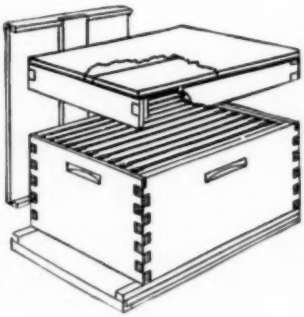
Special Prices

THE DIAMOND HIVE, K. D.

Wood cover, reversible bottom-board, standard Hoffman self-spacing frames, 10-frame size, per crate of five (5) complete hives,

$12.00

per crate.



THE STIRLING HIVE, K. D.

Metal cover, reversible bottom-board, standard Hoffman self-spacing frames, 10-frame size, per crate of five (5) complete hives,

$15.00

per crate.

STANDARD 10-FRAME HIVE BODIES, with Hoffman self-spacing frames, K. D. Per crate of 5	$6.75
STANDARD 10-FRAME HIVE BODIES without frames, K. D. Per crate of 5	$4.00
JUMBO HIVE BODIES with frames, K. D. Per crate of 5	$8.00
COMB SUPERS, No. 1 style, 4¼x4¼x1⅞", with section-holders, separators, K. D. Per crate of 5	$4.50
STANDARD HOFFMAN SELF-SPACING FRAMES. Per 100	$5.00

MEDIUM BROOD FOUNDATION.		THIN SUPER FOUNDATION.	
5-pound packages	60c per lb.	5-pound packages	65c per lb.
25 pounds or more	55c per lb.	25 pounds or more	60c per lb.

HOFFMAN & HAUCK, INC.

WOODHAVEN, NEW YORK, U. S. A.

Only One Hutzelman Solution

For the Treatment of American Foul Brood

To make this solution properly requires a complete knowledge of the chemistry of the ingredients used, as well as skill in the mixing.

o o o o

All new materials used by me in my solution are analyzed, re-processed, and refined, so as to avoid tainting the honey or poisoning the brood.

o o o o

Investigation has shown that out of forty-nine specimens of formaldehyde obtained on the open market, forty-eight contained decomposition products which are injurious to the honey and bees.

o o o o

Ordinary denatured alcohol as sold everywhere ought never to be used in the preparation of the alcohol-formalin solution, on account of the poisons it contains that would taint the honey or kill the brood.

o o o o

The solution I offer is guaranteed not to leave any trace of poison or foreign odor in the combs after drying.

o o o o

Patents pending in the United States and Canada.

For further information write

J. C. Hutzelman, M. D.

Glendale, Ohio

WOODMANS FAMOUS BEE WARE

The Smoker

You Ought to Own

THE most important invention in beekeeping, as little can be accomplished without the Bee Smoker.

The **new Bingham Bee-Smoker is the most** efficient and durable machine on the market. The standard for over 40 years in this and many foreign countries, and is the all-important tool of the most extensive honey producers of the world.

Comes with metal legs, metal binding and turned edges. The four larger sizes haveh inged covers. The fire grate is of very substantial material, with an abundance of draft holes, the 4-inch size having 381 holes, equal to an opening of 2-inch square.

A valve in the bellows of the larger sizes makes the Smoker respond to the most delicate touch.

The new Bingham comes in six sizes, including the Big Smoke, which is furnished both with and without shield. The larger sizes are best, as they hold moref uel, give more smoke. require filling less often, and are especially recommended to those who work with their bees several hours at a time.

Write for our complete catalog of bee supplies and accessories. Special circular of all sizes of Bingham Smokers free for the asking.

A. G. WOODMAN COMPANY

238 Scribner Avenue, N. W.
GRAND RAPIDS, MICH., U. S. A.

For sale by all G. B. Lewis Co. and Dadant & Sons agencies. They are also sold by many others in this and foreign countries. Insist on the best, the Bingham Smoker.

NEW BINGHAM BEE SMOKER
PATENTED

BIG SMOKE—With Shield.
Fire Pot, 4 x 10.

NEW BINGHAM BEE SMOKER
PAT.

DOCTOR.
Fire Pot, 3½ x 7.

LITTLE WONDER.
Fire Pot, 3 x 5½.

The Diamond Match Co.

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Manufacturers of

BEEKEEPERS' SUPPLIES

CHICO, CALIFORNIA, U. S. A.

The entire resources of this great plant are now near to you

The Diamond Match Co.'s Factories and Yards at Chico, Calif., cover 220 acres.

To meet the ever increasing demand for "Diamond" Beekeepers' Supplies, distributing warehouses have been established at Woodhaven, New York (Hoffman & Hauck); St. Louis, (The Diamond Match Co.); New Orleans, (The Diamond Match Co.). This will enable Beekeepers to obtain their supplies promptly and at a greatly reduced cost.

PRICE

Every dollar paid stands for actual value received; no money that is paid us is wasted in inefficient methods or by lack of intelligent foresight. From the falling of the tree to the finished hive, no middleman takes out a profit; full advantage of this saving is given to the purchaser.

Our emblem the "Diamond" is protected by excellence of workmanship.

THE DIAMOND POINTS OF DISTRIBUTION.

QUALITY

Diamond Hives, etc., which are manufactured from Sugar Pine from our own **forests**, present every desirable feature, and embody every improvement in design and betterment in construction. Diamond Hives have a reputation for high quality well nigh world-wide.

Beekeepers who study economy should consider the use of the Diamond Standard Supplies in their apiary. Diamond Foundation is uniformly excellent and means Foundation Satisfaction.

Write the Diamond Match Co., Apiary Department, Chico, California, for free catalog. Send all orders and inquiries to Chico, Calif. Shipment will be made from nearest distributing point named above.

Attractively decorated in green and orange, in an appropriate design. Lithographed containers like this are permanent advertisements for their users.

Half the Sale is in the Package

Give your honey every chance—pack it in this lithographed container

YOU have to use some kind of package for your honey. Why not use the one that will do most to help sell your brand?

Lithographed cans give your honey its best chance. They re-invite old customers and attract new ones.

Here's a brilliant, sales-making honey pail, available to you at very reasonable cost. It carries your name and brand in the space indicated. It identifies your honey to your customers. It helps you build up a steady trade—your *own* trade.

Write for sample and details

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